RECONNAISSANCE-LEVEL CHARACTERIZATION REPORT FOR TRAILER T112A AND TRAILER T112C

Revision 1

September 30, 1999

10/6/99
Date
10/6/99
RMRS / / Date
10/11/99
Date
10/8/99 Date
10/0/99 Date
10/6/99 Date

This Report was prepared by:

Tom South Project Manager, D&D Advanced Planning

Reviewed for Classification/UCNI/040

By: Janet Nesheim, Derivative Classifier

DOE, EMCBC

Date: _/b-/4_0

Confirmed Unclassified, Not UCNI /not OUO



September 30, 1999

BEST AVAILABLE COPY

REVIEWED FOR CLASSIFICATION

By 10599

ADMIN CORE

1/265





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\bigcirc		Property	Waste Sample
REL	EASE EVALUA Page 1 of <u>2</u>		·
Release Evaluation No.: 000124-T130B-001	EXTENDED: No	EXPIRES: <u>N/A</u>	Charge No.: <u>NG2200E1</u>
PART I		SENDER/CUSTODIAN	ACKNOWLEDGEMENT
Description of Property/Waste/Sample To Be I	Released/Transferred: Of	fice Trailers T112A and T112	С
Current Location: PU & D Yard			
Destination: Offsite sale or disposal			
New Recipient/Custodian: Dick Link	·		
History/Process Knowledge: See attached "Rec	connaissance Level Char	acterization Report for T112A	and T112C (Revision 1)"
Tas the specified material ever been in an RBA	A/CA or contacted DOE	controlled radioactive material	s? <u>Unkown</u>
1) By signing below, I certify information prov 2) By signing below, I agree to comply with th	vided in Part I of this rele e specific requirements r	ase evaluation to be true and a noted in Part II of this release e	ccurate.
Sender/Custodian:	Emp. No:	Date:1/2	4/00 Ext: <u>5352</u>
PART II		RADIOLO	OGICAL ENGINEERING
SPECIFIC REQUIREMENTS AND/OR CO of MARSSIM and RFCA and have been subject requirements and the results are contained in "I No further survey data is required for unrestrict	cted to the KH D & D Ac Reconnaissance Level Cl	Ivance Planning Process. The characterization Report for T112	detail of these survey
Evaluated: Radiological Engineer	Emp. No: _	Date: 1/24/	/ 00 Ext: 5109
APPI	ROVAL FOR TRANSF	FER/SHIPMENT	
Approved: Radiological Engineer	Emp. No:	Date: 1/2 4/	Ext: <u>3289</u>

2

Rev 08/98

@RAH



PROPERTY/WASTE RELEASE EVALUATION SIGNATURE REQUIREMENTS

Release Evaluation #: <u>000124-T130B-001</u> Page 2 of <u>2</u>

Release Evaluation for Waste:

A Release Evaluation for Waste requires an evaluation and unrestricted release approval signature. The evaluation signature is by the Radiological Engineer (RE) providing the methods or criteria for unrestricted release (i.e., survey requirements, analytical requirements, no survey required, etc.). The unrestricted release approval signature for a Release Evaluation for Waste shall be a RE authorized to provide unrestricted release approval. In addition, the evaluation and unrestricted release approval signatures shall not be the same RE. The intent of this provision is to provide peer review of the evaluation and method of unrestricted release. It is important the RE take the peer review process seriously and not become a "rubber stamp" for their fellow engineer.

Release Evaluation for Property:

A Release Evaluation for Property requires an evaluation and unrestricted release approval signature. For a Release Evaluation for Property, the evaluation and unrestricted release signature may be the same RE. In the past, only one signature was required for property for which a RE could provide an unrestricted release on the basis of process knowledge/history.

Release Evaluation for Samples:

Samples are any waste or material that is being shipped to an off-site facility for analysis. Samples that may be provided with an unrestricted release using process knowledge/history or standard contamination survey techniques may be authorized for shipment to an off-site facility using the signatory requirements specified for property. Samples which cannot be provided with an unrestricted release using process knowledge/history or standard contamination survey techniques shall be authorized for shipment from the Site using the methodology specified for waste, i.e., second signature being provided by a RE authorized to perform peer review and approval for shipment.

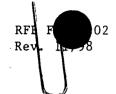
The approval for transfer/shipment section of a Sample Release Evaluation (SRE) shall be revised as noted below for samples which cannot be provide with an unrestricted release.

"The samples specified in Part 1 of this release evaluation are being provided with authorization for transport as non-radioactive materials in accordance with Department of Transportation (49 CFR) regulation. This authorization for shipment does not constitute an unrestricted release."

Additional Documentation:

Number of lines per section may be modified or additional pages attached to ensure adequate documentation of information necessary to perform release evaluation.

Additional pages or attachments to a release evaluation shall have the evaluation number, Page __ of __, initials of Radiological Engineer signing approval for transfer/shipment and date.



Declaration of Excess 002837 Property Custodian Name (Please Print) Employee Number Custodian Building DEVERSE NE 05 B280 3061 Custodian Room/Cube Thibe Filled Das Discosal Personne Request Date (O. Cl) Property Custod an Signature Extension/Pager 20 Unit of Cond Storage Rec'd Property Control Number Serial Number Description/Manufacturer/Model Number Qty Issue Code 8v Disa 01 TRAILER 0005621500 2330 02 03 04 05 06 07 08 09 10 Traveler No: <u>Unrestricted Property Release Approval</u>
The above described Item(s) has been evaluated "High Risk" Review Certification ADP Applicable Only Certification for Removal Hazardous Material **Einal Disposition** and/or Radiologically surveyed in accordance with These computer systems have met all security 1 - Transfer ☐ "No ECVProliferation" Concern RSP 9.01 and is approved for Unrestricted Release. requirements as outlined in the appropriate ACSSO≡ and 2 - Gift □ YES [] NO "Computer User Handbook" (Classified and Unclassified) 3 - Grant Property Release Log No:__ ☐ "High Risk" Property 4 - Sale If no, by signing below, I certify that all 5 - Low Level Waste PIWRE No: 0001,24-T130B-001 hazardous Material Constituents have been 6 - Donation removed from the Property ☐ "Export Controlled" Property CSSO Phint Nan Employee No 7 - Scrap 12.27.98 Date Export Control Officer Signature Date



Declaration of Excess

002845

	Property Custodian Name (Please Print) C. FERG Employee Number Custodian Building 280 YARD Property's Location 280 YARD Property Managether Approval S											at Signature and) / 2 U /					
Propert	Cystodian Signature	tus)	7534/2303 Cu	stodian Room/Cube 5.0	Request Da	12	4/00)	To be Filled Old By Disposal Personnel.									
Line Item	Property Control Number	Serial Number	Description/Manufacturer/M	Aodel Number		Qty	Unit of Issue	Cond Code	Go: Rec'd	Storage Location	Dete Rec'd	Rec'd By	FINE FSC Disp.					
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02			T112A	FICE, 5 WI		\												
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RSP 9.0	Unrestricted Property Release Approval The above described item(s) has been evaluated and/or Radiologically surveyed in accordance with RSP 9.01 and is approved for Unrestricted Release. Property Release Log No: 000124-T130B-0/ P/WRE No: 000124-T130B-0/ I "Export Controlled" Property ADP Applicable Only ADP Applicable Only These computer systems have met all security requirements as outlined in the appropriate ACSSOE and "Computer User Handbook" (Classified and Unclassified) If no, by signing below, I certify that all hazardous Material Constituents have been removed from the Property If no, by signing below, I certify that all hazardous Material Constituents have been removed from the Property These computer systems have met all security requirements as outlined in the appropriate ACSSOE and "Computer User Handbook" (Classified and Unclassified) If no, by signing below, I certify that all hazardous Material Constituents have been removed from the Property These computer systems have met all security requirements as outlined in the appropriate ACSSOE and "Computer User Handbook" (Classified and Unclassified) If no, by signing below, I certify that all hazardous Material Constituents have been removed from the Property These computer systems have met all security requirements as outlined in the appropriate ACSSOE and "Computer User Handbook" (Classified and Unclassified) If no, by signing below, I certify that all hazardous Material ADP Applicable Only These computer systems have met all security requirements as outlined in the appropriate ACSSOE and "Computer User Handbook" (Classified and Unclassified) If no, by signing below, I certify that all hazardous Material ADP Applicable Only I or																	
Employ Rad. Op	s/Rad Eng Signature L	- 	1 Control Officer Date	CSSO Signature		•	Date		nature	Dai	e	·						

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EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) was performed to free-release trailer 112C and dispose of trailer 112A as waste. This RLC implements the Pre-Demolition (final status) survey design based upon the Multi-Agency Radiation Survey and Site Investigation Manual (NUREG-1575). Physical, chemical and radiological hazards were assessed based on historical reviews, process knowledge (Appendix 1), and newly acquired RLC data (Appendices 2-4). Results indicate no radioactive or chemical contamination exists and no significant physical hazards are present. Trailer 112A contains asbestos as part of the floor tile, which is considered an integral part of the structure. Based on the assessment, the trailers are confirmed to be Type I facilities and can either be free-released to commerce (i.e., for sale and re-use), or disposed of as waste.

ABBREVIATIONS/ACRONYMS

ACM Asbestos containing material ASD Analytical Services Division

Be Beryllium

CBDPP Chronic Beryllium Disease Prevention Program

DCGL_{EMC} Derived Concentration Guideline Level – elevated measurement

comparison

DCGL_w Derived Concentration Guideline Level – Wilcoxon Rank Sum Test

D&D Decontamination and decommissioning

DDCP Decontamination and Decommissioning Characterization Protocol

DOE U.S. Department of Energy
DPP Decommissioning Program Plan

DQA Data quality assessment DQOs Data quality objectives

EPA U.S. Environmental Protection Agency FDPM Facility Disposition Program Manual

K-H Kaiser-Hill

LBP Lead-based paint LLW Low-level waste

LSDW Life safety disaster warning

MARSSIM Multi-Agency Radiation Survey and Site Investigation Manual

MDA Minimum detectable activity

MDC Minimum detectable concentration

NRA Non-Rad-Added Verification

OSHA Occupational Safety and Health Administration

Pb Lead

PARCC Precision, accuracy, representativeness, comparability and

completeness

PCBs Polychlorinated biphenyls PDS Pre-Demolition Survey

RCRA Resource Conservation and Recovery Act

RFCA Rocky Flats Cleanup Agreement

RFETS Rocky Flats Environmental Technology Site RLC Reconnaissance Level Characterization

RLCR Reconnaissance Level Characterization Report

SVOCs Semi-volatile organic compounds

TRU Transuranic

TSCA Toxic Substances Control Act
TSO Transportation Security Office
VOCs Volatile organic compounds

1.0 INTRODUCTION

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous buildings and structures will be removed. Among these are the trailers T112A and T112C, which are currently located in the Property Use and Disposition Yard near Building 280. These trailers no longer support the RFETS mission, and need to be removed to reduce Site infrastructure, risks and operating costs.

Before the trailers can be released, hazards must first be identified. Hazards identified will be used to plan final disposition. This document presents the existing physical, radiological and chemical hazards associated with the two trailers, and classifies the facilities pursuant to the RFETS Decommissioning Program Plan (DPP, K-H, 1998a). The hazards assessment is based on facility/process knowledge, operating and spill records, historical radiological and chemical data, and results of the RLC conducted. The RLC was conducted pursuant to the RFETS Decontamination and Decommissioning Characterization Protocol (DDCP). The content and outline of this report are consistent with the Kaiser-Hill (K-H) Facility Disposition Program Manual (FDPM, K-H, 1998b).

1.1 Purpose

The purpose of this report is to communicate and document the results of the RLC effort. The purpose includes both summarizing the data into concise, usable formats and interpreting the data for use in management decisions, primarily:

- Definition of individual hazards and overall risk associated with facility D&D;
- Typing of trailers based on hazards identified; and
- Ability to either free-release the trailers from the site, or dispose of them as waste.

1.2 Scope

This report covers physical, radiological and chemical characterization of T112A and T112C. Chemical characterization was conducted using Colorado Hazardous Waste Management regulations as a means to segregate materials as either hazardous or non-hazardous waste. Based on the hazards identified, the trailers were typed and assessed against free-release criteria.

2.0 OPERATING HISTORY AND PHYSICAL DESCRIPTION

2.1 Trailer 112A

This trailer was constructed/assembled at Central Avenue and Fourth Street, behind the northwest corner of Building 112, in the early1960s. The size of this trailer is approximately 45' X 60' X 10', and it is assembled from 5 trailer units of approximately 12' X 45' feet in size. There are four doors leading into this trailer. The siding is enamel on aluminum. Structurally the trailer is sound; there are no leaks in the ceiling, and the outside is not damaged. The interior "outside" walls are wood paneling over insulation, the interior partition wall is wood paneling on stud framing, and the floor is carpet and sheet vinyl/linoleum on wood. The ceiling is a drop type with acoustical tile panels. The trailer has men and women restroom facilities. The men's restroom has a hot water heater for the facility. The trailer also has five electric heat pumps for heating and air conditioning. T-112A has a smoke detection system and was connected to the Plant fire alarm and life safety and disaster warning (LSDW) systems. No other equipment remains in the trailer.

On July 21, 1999, the trailer was separated into five separate units and transported to the site Property Utilization and Disposition yard near Bldg. 280. The units were positioned in their original configuration, with approximately 6 inches of separation between units. Some debris was removed.

Prior to the Radio and Page Operations moving into T-112A, the south half of the trailer was used as a telecommunications office. The RFETS Traffic Department originally occupied the north section of T-112A. The south half of T-112A was a Company Store when the RFETS was managed and operated by Rockwell International (from approximately 1975 to 1990). Later the north section of T-112A was used by RFETS Transportation Security Office (TSO) Scheduling. Both the telecommunications and TSO groups vacated this trailer in March 1999. The trailer has remained unoccupied.

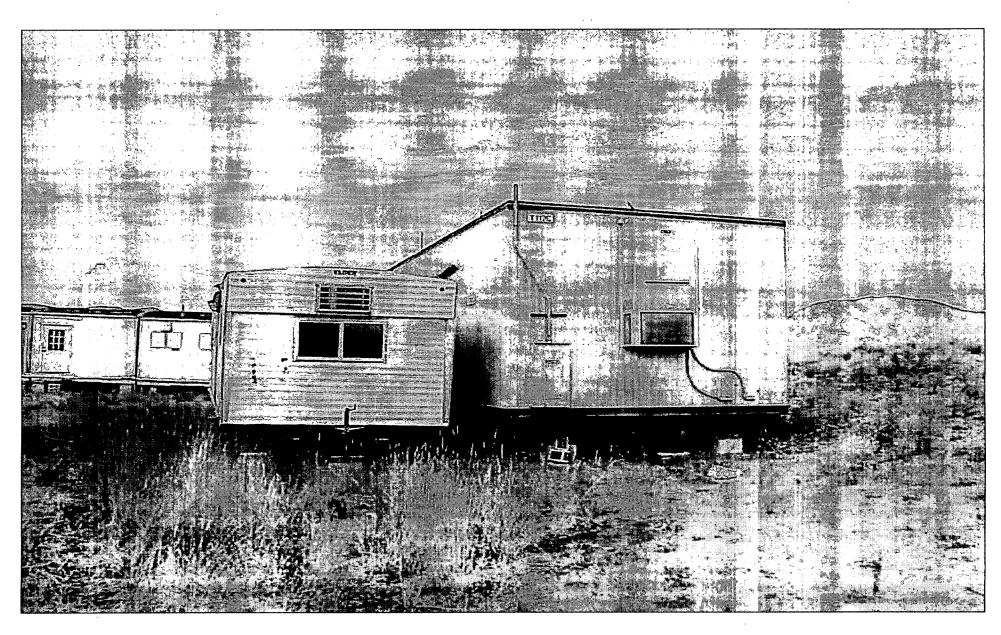
2.2 Trailer 112C

This trailer was brought onsite and placed at Central Avenue and Fourth Street in 1991. The size of this trailer is 14' - 0" X 60' - 3" X 13' - 10" at the roof edge. There are two doors leading into this trailer. The siding is enamel baked on aluminum. Structurally the outside has a panel that has been torn loose and part of it has blown away; inside, the condition is good. The interior "outside" walls are vinyl over 4' x 8' dry wall over insulation, the interior "partition" walls are the same materials on stud framing. The ceiling is a drop type with 2' x 4' acoustical tile panels and the floor is carpet over wood flooring. The trailer has an electric heat pump for heating and cooling and a fire sprinkler system, and it was connected to the Plant fire alarm and LSDW systems.

This trailer has been used as office space since it has been on site. There are six hard-walled rooms, of which five are offices. The sixth contains the telecommunication equipment and the fire sprinkler controls. The last occupant was Wackenhut Services which, used it as a scheduling office. They moved out in 1998. The trailer was moved to the site Property Utilization and Disposition Yard near Bldg. 280 on July 21, 1999. The trailer has remained unoccupied. Refer to Exhibit 2-1 for an exterior photograph of the trailers.



Exhibit 2-1 Exterior Photograph



3.0 SUMMARY OF CHARACTERIZATION ACTIVITIES

An RLC was designed to demonstrate that DOE-added radioactive materials are not present or have been removed from RFETS facilities to the extent that residual levels of contamination are below the Derived Concentration Guideline Levels (DCGLs) and that the trailers can either be free-released or disposed of as waste. This section of the RLC Report (RLCR) presents DQOs used, historical data, and additional RLC data needed to release the trailers. The section also describes the survey area and survey unit for the trailers, and defines the methods that were implemented in collecting radiological surveys, scans and samples. The survey followed the guidance provided in NUREG-1575, the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).

3.1 Data Quality Objectives

The following section outlines the DQO process used in designing the RLC Package.

The Problem

The problem involves quantifying the amount of material, media, equipment, floors, walls and ceilings, interior/exterior to the buildings and determining the extent of radiological and non-radiological contamination so that remaining floors, walls and ceilings can be free-released (i.e., no chemical and radiological hazards remain).

The Decision

The decision is verification that free-release and waste management standards have been met.

Inputs to the Decision

The input to the decision includes data from preceding characterizations, including historical data and process knowledge; data collected from this pre-demolition survey; and applicable action levels, free-release criteria, transportation requirements, waste management regulations, pollution prevention/waste minimization criteria, and waste acceptance criteria.

Decision Boundaries

The decision boundaries include the floors, walls, ceilings, roof and fixed equipment located in T112A and T112C.

Decision Rules

This section develops the rules to support the decisions regarding characterization data.

Radionuclides

- If process knowledge/history supports the premise that no radioactive contamination is present, and a pre-demolition survey has been performed and approved, the related area and/or volume is considered sanitary waste or may be free-released.
- If all radiological survey measurements are below the surface contamination thresholds provided in DOE Order 5400.5 (Radiation Protection of the Public and Environment) and/or are within background concentrations for volume contamination material (refer to Radiological Safety Practices 09.03, "Unrestricted Release of Build or Volume Material"), the related area or volume of material is considered sanitary waste or may be free-released.
- If all radiological sample measurements are below the volume contamination thresholds provided in the No-Rad-Added Verification (NRA) Program, the related volume of material is considered sanitary waste or may be free-released.
- If any radiological sample measurement exceeds the volume contamination threshold provided in the NRA Program, the associated volume must be remediated or disposed of as radiological or mixed waste.
- If any radiological survey measurement exceeds the surface contamination thresholds provided in the RFETS Radiological Control Manual, the associated surface area must remediated or disposed of as radiological or mixed waste.
- If any radiological sample measurement (or disposal unit volume) exceeds 100 nanocuries per gram of transuranic material, the associated volume must be disposed of as transuranic (TRU) waste.

RCRA Constituents

If the waste is mixed with or contains a listed hazardous waste, or if the waste exhibits a characteristic of a hazardous waste, then the waste is considered RCRA-regulated hazardous waste in accordance with 6 CCR 1007-3, Part 261. If the waste is free from listed hazardous waste, and does not exhibit a characteristic of a hazardous waste, the waste is considered non-hazardous.

CERCLA Hazardous Substances

If the waste contains a listed hazardous substance above the CERCLA reportable quantity (40 CFR 302.40), notify the receiving disposal facility of the hazardous substance and estimated quantity prior to shipment.

Beryllium

If detectable beryllium contamination can be shown through process knowledge to consist of beryllium powder (P015 under RCRA), then the contaminated materials will be treated as RCRA waste and subject to treatment standards under 40 CFR 268.40.

If concentrations of beryllium are equal to or greater than 0.2 ug/100 cm², the material is considered beryllium contaminated per the Occupational Safety and Industrial Hygiene Program Manual, Chapter 28, Chronic Beryllium Disease Prevention Program (CBDPP). If the concentrations are below 0.2 ug/100 cm², the material is considered non-beryllium contaminated.

Polychlorinated Biphenyls (PCBs)

- If material meets the definition of "Bulk Product Waste," it may be disposed of as
 Toxic Substances Control Act (TSCA) waste at a permitted solid waste disposal
 facility without further characterization (Federal Register, Vol. 63, No. 124, June 29,
 1998,40 CFR §761.62,). If the disposal facility does not possess a commercial PCB
 storage or disposal approval, the generator must provide written notification to the
 facility in accordance with §762.62.
- If material meeting the definition of Bulk Product Waste is to be free-released (e.g., recycled), the 95% upper confidence limit of the mean value of a representative sample set cannot exceed 50 ppm. This determination can be made through process knowledge or laboratory analysis.
- If material meets the definition of PCB remediation waste (i.e., potentially containing PCBs form historical releases; §761.61), the free-release concentration is ≤1 ppm PCBs, as determined in accordance with requirements of §761.61, Subpart G. Higher release levels for PCB remediation wastes are permissible, but carry specific restrictions on disposition of the material.

Asbestos

In accordance with 40 CFR 763 and 5 CCR 1001-10, if any one sample of a sample set representing a homogeneous medium results in a positive detection (i.e., >1% by volume), then material is considered Asbestos Containing Material (ACM); otherwise the material is considered non-ACM.

Tolerable Limits on Decision Error

The maximum value for false positive and false negative errors is 5% when calculating the number of samples required.

Optimization of Plan Design

Radiological characterization was conducted on interior floors, walls and ceilings, and exterior walls and roofs as necessary. The following criteria were used to develop the radiological survey/sampling characterization package:

- Radiological field measurement methods and instrumentation are described in Section 6 of MARSSIM.
- Radiological sampling and preparation for laboratory measurements are described in Section 7 of MARSSIM.
- For materials, media, equipment, floors, walls, and ceilings being released as low level and/or TRU waste, radiological surveys/samples are taken per Site Procedure 1-PRO-079-WGI-001, Waste Characterization, Generation and Packaging.
- If radiological survey/samples are required for materials, media and equipment for release as non-radioactive waste, then radiological surveying and sampling are conducted per the requirement in the RFETS HSP 18.10, Radioactive Material Transfer and Unrestricted Release of Property and Waste.
- If RCRA, TSCA or asbestos surveys/samples are required for materials, media, equipment, floors, walls and ceilings, Sampling and Analysis Plans are required per Section 6.0 of the D&D Characterization Protocol.

3.2 Radiological Characterization

Radiological characterization was performed to understand the nature and extent of radioactive materials that may be present in Trailers 112A and 112C. This section reviews the historical radiological data on these Trailers and discusses the RLC conducted. Radiological hazards and RLC data are discussed in Section 4.2, and RLC radiological data are presented in Appendices 2-4.

3.2.1 Summary of Historical Data

Historically, radiological surveys for T112A and T112C may have been performed, but the data are not readily available. There are no Plant Action Tracking System items outstanding on these trailers, which indicates no associated radiological program deficiencies. Trailers T112A and T112C are individually listed in I-P73-HSP-18.10, Radioactive Material Transfer And Unrestricted Release Of Property And Waste, Appendix 4, Unrestricted Release Building/Facility List. This listing authorizes the unrestricted release of administrative, non-hazardous property located in the trailers without radiological surveys or Radiological Safety signature for off-site shipment or transfer to PU&D, and is indicative of structures with a low probability of radioactive contamination. These assumptions do not directly apply to the trailer structures themselves, but does illustrate an area with a very low probability for radioactive contamination.

3.2.2 Summary of RLC Data Collected

Although historical review indicates no use of DOE radioactive material, insufficient quantitative radiological data exist to designate Trailers T112A and T112C as non-impacted pursuant to MARSSIM. Therefore, radiological surveys and scans were performed, and radioactive samples were taken and analyzed. Direct radiological surveys and scans were performed on the interior and exterior of both trailers for removable and total, alpha and beta contamination. Four radiological samples were taken from the roof of T112 A. The interior of T112A was designated as Survey Unit A, the exterior of T112A was designated as Survey Unit D, and the interior and exterior of T112C was designated as Survey Unit C.

3.2.3 Sampling and Field Measurement Methods, Procedures and Equipment

Total alpha and beta survey measurements were taken with the NE Electra using a DP-6 probe, and removable alpha and beta measurements were taken with the Eberline SAC-4 and BC-4, respectively. Radiological scans for total alpha and beta were taken with the NE Electra at a scan rate of 1.5 inches per second. Samples were screened on-site for alpha activity with the AP-2 and sent off-site for radiochemical analysis (alpha spectrometry). Radiological surveys, scans and samples were taken per the requirements of the RFETS Radiological and Non-Radiological Trailer 112A-C Characterization Package, Revision 0 dated August, 1999 (refer to Appendix 5). All radiological samples were taken in accordance with Analytical Services Division (ASD) requirements.

A total of 64 measurements were taken within each survey unit. Each measurement and duplicate location was measured for total alpha, total beta, removable alpha, and removable beta). Twenty duplicate measurements were taken as well. The number of total surface and removable alpha measurements for floors, walls, ceilings, roofs, and fixed equipment were calculated based on MARSSIM statistical calculations. In addition, alpha scans of 10% of the total survey unit surface area were performed at biased (judgmental) locations on accessible surfaces. The scans were biased relative to those locations with the greatest potential for radioactive contamination based upon routine use of the trailer (i.e., "foot traffic"), and potential for exterior contamination (i.e., airborne fallout). The scan data were recorded as selected maximum values over the entire scan area of interest for the survey unit.

The appropriate number of survey points was calculated, and specific survey locations were selected using a random number generator. The actual measurements were taken at each grid intersection. If grid intersections (nodes) were inaccessible, the measurement was obtained as close as possible to the grid intersection, and the new location was annotated on the survey map.

Measurement locations were clearly identified by labels to provide a method of referencing survey results to survey measurement locations. These measurement locations were incorporated into a grid map at survey densities of 1 meter square.

Numerical results of this activity as well as statistical data analyses are detailed in the Appendices for each survey unit.

3.2.4 Laboratory Analysis

Radiological samples were analyzed per the requirements of the Final Sampling and Analysis Plan for Roofing Material from Trailers 112A and 112B for isotopic analysis dated July 21, 1999 (refer to Appendix 6). All radiological samples were analyzed in accordance with APO requirements.

Samples were managed to ensure an accurate record of sample collection, transport, analysis, and disposal. This management ensures that samples are neither lost nor tampered with and that the samples analyzed are traceable to a specific location in the field. Chain-of-custody documentation captures this process for all samples submitted for laboratory analysis. The chain-of-custody forms are included as part of survey documentation in Appendix 3 (Survey Unit D).

All samples collected for RFETS laboratories or approved contracted laboratories were analyzed via a Site-approved method. Individuals trained to use appropriate equipment and procedures performed the analyses. The laboratories selected have sufficient analytical capabilities for the radionuclides of interest (plutonium, americium, and uranium) and an established quality assurance/quality control program that assures the validity of the analytical results. The laboratory analytical methods used are capable of measuring levels at or below 50% of the established release criteria. All results state the detection limit for the analysis. Results are detailed in the Appendices for each individual survey unit.

3.3 Chemical Characterization

Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present in Trailers 112A and C. Characterization was based on a review of historical and process knowledge and is presented in this section. Related hazards are discussed in Section 4.3.

3.3.1 Summary of Historical Data

Information on contaminants of concern (i.e., asbestos, beryllium, RCRA constituents, lead in paint, and PCBs) is presented below.

Asbestos: Historical asbestos inspection data exist for T112A. Thirteen samples of floor tiles, wall, and ceiling material were taken in T112A, and of these, four floor tile samples were determined to be asbestos-containing.

T112C underwent asbestos inspection in 1994, and nine samples of resin, paint, and plaster were taken. None were found to be asbestos-containing.

Beryllium: There is no record of beryllium operations or storage being conducted in the two trailers (*D&D Facility Characterization Interview Checklist, Facility Checklist, HRR Manager's Report,* and *List of Known Beryllium Areas*).

The CBDPP conducted an independent beryllium survey of T112A, which confirmed the absence of detectable beryllium contamination. Beryllium smears were collected at five locations in T112A. All results were below the detection limit of 0.1 μ g/100 cm². The action level for beryllium surface contamination is 0.2 μ g/100 cm². In light of the known history of the trailers, the CBDPP assumes that these results were representative of both trailers. No additional sampling for beryllium was conducted.

RCRA/CERCLA Constituents (including metals and VOCs/SVOCs): According to historical and process knowledge, no chemicals were used or stored in any of the two trailers (*D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report*). Therefore, sampling for chemical contaminants is unnecessary and was not conducted.

Lead in paint: Paint on the interior and exterior surfaces of the trailers and wooden stairs and platforms was not characterized for Pb in paint. Environmental Waste Compliance Guidance #27, Lead-based Paint (LBP) and Lead-based Paint Debris Disposal, has directed that LBP debris generated outside of high contamination areas shall be managed as non-hazardous (solid) wastes and need not be sampled unless the potentially lead-containing component is to be scabbled or otherwise comprise a separate waste stream. Therefore, analysis for lead in paint was not required.

Polychlorinated Biphenyls: A high voltage electrical power transformer is mounted on a concrete pad outside the southwest corner of T112A, and is labelled "No PCBs." There is no record of PCB product use or storage in either of the trailers (*D&D Facility Characterization Interview Checklist, Facility Checklist: and HRR Manager's Report*). Therefore, analysis for PCBs within the trailers is unnecessary and was not conducted.

Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition, has directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification) in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761.3 and 40 CFR 761.62 paragraph (b) and therefore need not be sampled as long as restrictions outlined in 40 CFR 761.62 regarding their disposition are met.

The exterior surfaces of the trailers are painted tan. The interior surfaces of each trailer are covered with paneling. Historical data and process knowledge give no reason to suspect that any specialized paints or coatings associated with PCBs were applied to the trailers. Therefore, the trailers were not characterized for PCBs in paint.

Fluorescent light ballasts were inspected by a site electrician. Several PCB-containing ballasts were discovered in T112A, two of which showed evidence of minor internal

leakage within the lighting unit, above the faceplate. None were discovered in T112C. All PCB-containing ballasts were removed. No further characterization was required.

3.3.2 Summary of RLC Data Collected

An asbestos inspection was conducted by a CDPHE-certified asbestos inspector. A single sample of roofing material was collected from Trailer 112A. Visual inspections of the trailers' roofs, interior and exterior panels, walls, and floors revealed no evidence of chemical spills or releases (i.e., stains, discoloration, odors, or other physical characteristics). Based on historical information presented in Section 3.3.1 and the inspections conducted, the only additional RLC data required was the sample collected for asbestos analysis from Trailer 112A.

4.0 HAZARDS

4.1 Physical Hazards

Current physical hazards associated with the Trailers T112 A and T112C consist of those common to standard industrial environments. The trailers are not connected to any utilities, such as electricity and gas. Physical hazards are controlled by the Site Safety and Industrial Hygiene Program, which is based on OSHA regulations and standard industry practices.

4.2 Radiological Hazards

Based on historical knowledge and the RLC, Trailers T112A and T112C are classified as MARSSIM Unimpacted Class 3 (i.e., Type I pursuant to the DPP). These trailers do not contain radiological contamination above the free-release limits prescribed in DOE Order 5400.5 and the RFETS Radiological Control Manual. Survey results were below DCGLs (refer to Table 4-1), as were all scans. The two T112A roof samples were also below the total and removable alpha DCGLs (refer to Table 4-2). RLC data are presented in Appendices 2-4, by survey unit, for removable alpha, removable beta, total alpha and total beta, each in separate tables. Appendix 2 presents data for Survey Unit A, which includes the interior of T112 A. Appendix 3 presents data for Survey Unit D, which includes the exterior of T112 A. Appendix 4 presents data for Survey Unit C, which includes the interior and exterior of T112 C.

4.3 Chemical Hazards

For each trailer, the potential for a hazard due to each of the following contaminants was considered:

- Asbestos.
- Beryllium;
- Lead and other metals;
- VOCs/SVOCs:
- PCBs.

The need for analysis of each potential hazard was evaluated based upon historical and process knowledge, given that the trailers were used exclusively for administrative purposes. The chemical hazards are summarized in Table 4-3.

4.3.1 Asbestos

Historical asbestos data indicated that four floor tile samples in T112A contain asbestos. The inspection conducted as part of RLC also determined that the flooring cement contains ACM.

Additionally, a sample of roofing material consisting of gray plaster was taken at the junction of two trailer units. This material was presumably used to seal the trailer units

together at their junctions, and contained a brown resinous material as well as some of the silver/black paint which covered the roof. This sample contained chrysotile asbestos in both the plaster and paint layers. However, all of the asbestos-containing material in the trailer was non-friable and therefore does not constitute a hazard.

Historical asbestos data indicate that no asbestos is present in T112C (refer to Section 3.3.1).

Table 4-1 Summary of Radiological Survey Data

			Remo Contam	vable ination	1			otal nination	1			
			lpha /100 cm²)		eta 00 cm²)	Alp (dpm/10		Beta (dpm/100 cm ²)				
	DCGL'		20	10	000	10	0	50	00			
	Survey Points	Min.	Max	Min.	Max.	Min.	Max	Min.	Max			
T112A Interior Survey Unit A	16	0.0	3.0	-44.0	28.0	-14.0	5.0	-845.0	-277.0			
T112A Exterior Survey Unit D	16	0.0	10.6	-60.0	44.0	10.0	90.0	-256.0	336.0			
T112C Interior and Exterior Survey Unit C	16	0.0	4.5	-40.0	40.0	4.0	94.0	-364.0	281.0			

Table 4-2 Radiological Sample Results for T112A Roof

ROOF CENTER

ISOTOPE	Reported Activity	MDA (pCi/g)	Converted Activity (dpm/100cm ²)	Converted MDA (dpm/100cm²)	DCGL ¹ (dpm//100cm²)
U-233/234	0.264	0.034	6.8	0.9	1000
U-235	0.016	0.042	0.4	· 1.1	1000
U-238	0.270	0.050	7.0	1.3	1000
Pu-239/240	0.000	0.045	0.0	1.2	20
Am-241	0.000	0.086	0.0	2.2	20

SW CORNER

ISOTOPE	Reported Activity (pCi/g)	MDA (pCi/g)	Converted Activity (dpm/100cm ²)	Converted MDA (dpm/100cm²)	DCGL ¹ (dpm/100cm ²)
U-233/234	0.259	0.072	6.0	1.7	1000
U-235	0.000	0.043	0.0	1.0	1000
U-238	0.332	0.035	7.7	0.8	1000
Pu-239/240	0.017	0.045	0.4	1.0	20
Am-241	0.000	0.053	0.0	1.2	20

¹ DCGL – Derived Concentration Guideline Level

4.3.2 Metals (including beryllium and lead in paint)

According to historical and process knowledge, no metals, including beryllium and lead, were used or stored in the two trailers, and therefore, no related hazards are present.

4.3.3 VOCs/SVOCs

According to historical and process knowledge, no chemicals were used or stored in either of the trailers, and therefore, no related hazards are present.

4.3.4 PCBs

All PCB-containing ballasts have been removed. There is no record of PCB product use or storage in any of the trailers, and therefore, no related hazards are present.

Table 4-3 Summary of T112A and T112C Chemical Hazards

		T	
Contaminant	Analysis	Historical	Below release
of Concern		or RLC?	limit or regulatory
			thresholds?
Asbestos	Four floor tile samples in T112A	Historical	Yes ¹ .
	were determined to contain		
	asbestos in the mastic.		
	Cove base cement in T112A was	RLC	•
	assumed asbestos-containing.		
,	·		
•	A comple of T112A moding	RLC	
	A sample of T112A roofing material contained asbestos.	RLC	
	material contained aspestos.		
	No asbestos was detected in	Historical	
·	T112C.	Instancai	
Beryllium	Surface smears in T112A	Historical	Yes.
J 5. J	(considered representative of	1	,
	T112A and T112C due to trailers		
•	being used solely for		
•	administration).		
VOCs/SVOCs	No history of use or storage. No	Historical	Yes.
	characterization was required.		
Lead in paint	No characterization has been	Historical	Yes ² .
	performed.		_
PCBs	All PCB ballasts have been	Historical	Yes ³ .
	removed, including two in T112A		,
	which were potentially leaking		
	inside the face plate.		
	No specialized paints or coatings		
	were observed. No		
	characterization for PCB in paint		
	was performed.		

- 1 Notification of the State and of the waste disposal facility of the presence of non-friable asbestos is required.
- 2 Environmental Waste Compliance Guidance #27, Lead-based Paint (LBP) and Lead-based Paint Debris Disposal, has directed that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes and need not be sampled unless the potentially lead-containing component is to be scabbled or otherwise comprise a separate waste stream.
- Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition, has directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification) in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761.3 and 40 CFR 761.62 paragraph (b) and therefore need not be sampled as long as restrictions outlined in 40 CFR 761.62 regarding their disposal are met.

5.0 DATA QUALITY ASSESSMENT (DQA)

Data used in making disposition decisions must be of adequate quality. Adequate data quality for decision-making is required by applicable RMRS and K-H corporate policies (RMRS, 1998, §6.4 and K-H, 1997, §7.1.4 and 7.2.2), as well as by the customer (DOE, RFFO; Order O 414.1, Quality Assurance, §4.b.(2)(b)). Regulators and the public also expect decisions and data that are technically and legally defensible. Verification and validation of the data ensure that data used in decisions resulting from the RLC are usable and defensible.

The DQA consists of revisiting the DQOs used and determining whether those objectives were met. This data evaluation also consisted of verifying and validating the RLC data, which ensures that data input into decisions are accurate, precise, representative, complete, and comparable. Because only radiological data were collected for the project (i.e., no chemical surveys or samples were required), the DQA addresses only radiological survey and sample results.

Many of the DOE quality elements of Order 414.1 are inherent within the MARSSIM guidance, as DOE was a co-author of MARSSIM. The RLC for trailers 112A and 112C was conducted in accordance with the FDPM and the DDCP. These programs exist within the Site's DOE approved QA Program which accommodate applicable sections of NQA-1. Adequate implementation of the quality elements required by DOE Quality Assurance Order (414.1) was corroborated through the verification and validation process described within this section.

Original DQOs of the project are stated in §3.0. Problems, decisions, decision inputs, project boundaries, and error tolerances were adequately defined. Original estimates of sample types, quantities, and gridding locations/densities were confirmed by using statistics (vs. assumed values) derived from the actual data collected for the project.

The DQA presented in this section supports conclusions through implementation of the guidelines taken from the following MARSSIM sections:

- §4.9, Quality Control
- §8.2, Data Quality Assessment
- §9.0, Quality Assurance & Quality Control
- Appendix E, Assessment Phase of the Data Life Cycle
- Appendix N, Data Validation using Data Descriptors

The MARSSIM-recommended criteria for verification and validation of Pre-Demolition (final status) survey data, listed above, are summarized in Table 5-1. The MARRSIM criteria are listed across the top of the table whereas the project's proof of implementation is listed along the left-hand side of the table. One or more "checks" per column exhibit compliance with the MARSSIM criteria.

As stated previously, the decisions for both Trailers 112A and 112C are that contamination levels are below free-release criteria, for chemicals and radionuclides. The conclusion with respect to radiological contamination is derived with 95% confidence based on use of MARSSIM methodology in the survey units' design.

Reconnaissance-Level Characterization Report for T112A and T112C Rocky Flats Environmental Technology Site 9/30/99

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Trailers 112A and C Survey Compliance with MARSSIM Data Quality Guidelines Table 5-1

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5.1 VERIFICATION OF RESULTS

Verification ensures that data produced and used by the project are documented and traceable per quality requirements. Verification consisted of reviewing the project's data relative to three subsets:

- 1. Radiological scans,
- 2. Radiological static surveys for removable and total contamination, and
- 3. Radiochemical data resulting from samples taken and subsequently analyzed via alpha spectrometry.

Verification confirmed that:

- Chain-of-custody was intact from initial sampling though transport and final analysis;
- Preservation and hold-times were within tolerance;
- Format and content of the data are clearly presented relative to goals of the project, i.e., to determine, with at least 95% confidence, that the survey units of interest (T112A and T112C) are adequate for radiological free release.

Verification of the T112A and C Trailers RLC data also confirmed the presence of quality records representing implementation of the following quality controls:

- Calibrations (radiochemistry, surveys and scans), for accuracy;
- Laboratory control samples (LCS -- radiochemistry), for accuracy;
- Blanks (radiochemistry), for accuracy;
- Duplicate measurements (radiochemistry surveys and scans), for precision;
- Chemical yield (radiochemistry), for accuracy;
- Count times (radiochemistry surveys and scans), for sensitivity;
- Sample preparations (radiochemistry), for accuracy, representativeness.

Items requiring survey coverage were verified as follows:

- A grid survey map was developed for each survey unit.
- The grid survey maps served as an index of the subunits, and defined the subunit boundaries.
- Each grid survey map used to document Electra and Eberline surveys was reviewed against the trailer floor plan map for coverage.
- Because every grid survey map was correlated to a survey form, and all survey forms were inventoried via the survey summary sheet, 100% coverage of every subunit was assured.

Upon completion of the data management activities listed above, an independent peer review was performed on each survey package.

In summary, the verification confirmed that documentation and quality records are intact for the project, which in turn corroborates implementation of the required technical

quality controls and administrative requirements, particularly verification of those documents and records that will ultimately support the CERCLA Administrative Record. All relevant Quality records associated with T112A and T112C RLC decisions will be submitted to the RMRS Records Center for permanent storage within 30 days of the conclusion of the project.

5.2 VALIDATION OF RESULTS

Validation consisted of a technical review of all data that directly support the RLC decisions. Any limitations of the data relative to project goals are delineated, and the associated data are qualified accordingly. Data were validated relative to quality criteria discussed throughout previously noted MARSSIM sections and the PARCC parameters.

PARCC parameters are consistent with "data descriptors" in MARSSIM and address characteristics of the data that must be defined for scientific integrity and defensibility. The next section, which addresses the PARCC parameters -- Precision, Accuracy, Representativeness, Comparability, and Completeness, also include discussion on bias and sensitivity, two more data descriptors emphasized in MARSSIM.

Validation of analytical data to K-H contractual requirements (K-H Statements of Work) is currently performed on a site-wide basis at ~25% frequency by the K-H Analytical Services Division. Satisfactory validation at this frequency indicates that subcontracted laboratories are operating competently relative to industry-wide standards, and more specifically, that sample custody and analytical procedures are implemented under defined quality controls on a site-wide, programmatic basis. Site-wide data validation coupled with annual laboratory audits provide the inference that all analytical results not specifically validated are represented by the percentage that is validated. Radiochemistry performed for this RLC was verified as meeting K-H contractual requirements -- Module RC01-B.3 for alpha spectrometry (4/24/98 and Module 9, 7/6/98).

5.2.1 PRECISION

5.2.1.1 Radiological Surveys and Scans

Precision of the radiological instrumentation was satisfactory based on tolerance charting of daily source measurements for each individual sensor used on the project, which includes all measurement types (scans and static measures for total contamination and swipes for removable). Adequate precision was established through instrument performance within a ±20% range as defined by measurement results compared to a standard source value. Based on standard protocol (e.g., Procedures 1-P73-HSP-18.10, Radioactive Material Transfers and Unrestricted Release of Property and Waste, and 3-PRO-165-RSP-0702, Contamination Monitoring Requirements), any measurement exceeding the defined tolerance limits required corrective action (repair or replacement) prior to the instrument's use during pre-demolition survey.

Duplicate measurements were acquired for total and removable surface activity measurements at $\geq 30\%$ frequency per survey unit. All duplicate measurements were within tolerance based on the acceptance criterion that both results be below Derived Concentration Guideline Level-Averaged Measures (DCGL_W) (note: even if populations were "significantly" different between real and duplicate results, if both duplicate and real population statistics are less than action levels, the difference between duplicate and real values is, ultimately, insignificant relative to free-release decisions).

5.2.1.2 Radiochemistry

Results from laboratory duplicates indicate adequate lab precision based on duplicate results within statistical tolerance values (>90% confidence of equivalency between the original sample and the duplicate). Although field duplicate samples were not acquired for determination of overall project precision, agreement between the two samples to within a range less than the DCGL_W indicates that reproducibility is adequate for project decisions (i.e., relative to free-release of materials).

5.2.2 ACCURACY (and Bias)

5.2.2.1 Radiological Surveys and Scans

Accuracy of radiological surveys and scans is satisfactory based on RFETS-programmatic annual calibrations that establish instrument efficiencies and sensitivities for all instrumentation used on this project. Daily source checks also provided periodic checks to ensure that all sensors are within tolerance during daily operations. Calibration and calibration check results were within the RFETS and industry-standard requirement of 20% of the applicable reference standard values. Full-scale, multi-point calibrations provided accuracy of ± 10% prior to implementation of survey instruments in the field, consistent with guidelines put forth in ANSI-N323.d

Total beta results for Survey Unit A may appear to be biased low based on the consistently negative values (with an arithmetic average of -519 dpm/100cm) for the Unit A sample set. However, based on the method by which local area backgrounds were attained relative to measurements acquired within the 112A Trailer, negative values can be expected. Local area backgrounds for the NE Electra DP6 were determined at approximately 3 ft above ground level outside the trailer location; probes were held face up at waist level and underwent a 1-minute count time. In contrast, trailer-interior measurements are acquired at relatively higher elevations (above grade), and are shielded from much exterior "shine" within the trailer. As a result, the high background and/or low instrument bias would not appear to impact Survey Unit decisions, as the levels are significantly lower than the free-release action levels (5000 dpm/100cm²).

Removable beta results might also appear to have a slight negative bias based on performance check results that are consistently below zero (i.e., within the negative acceptance range). Such instrument performance, when consistently below the standard reference values, suggests that instrument efficiency may need to be adjusted

upward for more accurate results. This is due to using an assumed minimum efficiency of 25% for BC 4s when actual efficiencies are higher. However, as discussed above, the magnitude of the negative values does not suggest a potential bias high enough to compromise survey unit decisions.

Several survey measurements for total alpha exceeded free-release levels, however, upon re-survey yielded results well below free-release levels. The re-survey results, which did not confirm the initial elevated values, indicate that initial results were false positives (i.e., initial readings were caused by naturally occurring radioactive progeny and were not DOE-added radionuclides of concern).

5.2.2.2 Radiochemistry

Accuracy of the radiochemical results were within tolerance and acceptable based on the associated results of laboratory control samples and calibrations at the laboratory. Preparation blanks also confirmed that no significant cross-contamination occurred in the analysis process. Uncertainties of the radiochemical results are quantified for each sample by both 2-sigma error (probabilistic) and total error (systematic + probabilistic). Uncertainties associated with the alpha-spectrometry analyses were within standard industry magnitudes.

5.2.3 REPRESENTATIVENESS

Samples, surveys and scans are representative based on the following criteria:

- Familiarity with facilities -- multiple walk-downs and collaborations by management and technical staff;
- Implementation of industry-standard chain-of-custody protocols;
- Compliance with sample preservation and hold times;
- Documented and (site) approved methods;
- Radiochemistry (alpha spectrometry) via K-H Module RC01-B.3;
- Radiological surveys via Contamination Monitoring Requirements (3-PRO-165-RSP-07.02);

Quality Assurance assessments were limited to the DQA presented in this section; no other site assessments were performed.

5.2.4 COMPLETENESS

The data set for this project is complete, with respect to surveys scans, samples and associated quality records ("data packages") resulting from the characterization process. Table 6-2 summarizes the minimum required number of samples surveys/scans, the actual quantity of samples/surveys/scans to date, and whether DQOs were achieved.

Table 5-2 Data Completeness Summary

Rad Measurement Type	Required # of Samples/ Surveys/Scans	Actual # of Samples/ Surveys/Scans	Comments
Survey Unit A (T112A	Interior)		
Eberline SAC-4 (removable alpha)	13	16	DQO achieved
Eberline BC-4 (removable beta)	13	16	DQO achieved
NE Electra (total alpha and beta)	13	16	DQO achieved
Survey Unit C (T112C	Interior and Exterior)		
Eberline SAC-4 (removable alpha)	13	16	DQO achieved
Eberline BC-4 (removable beta)	13	16	DQO achieved
NE Electra (total alpha and beta)	13	16	DQO achieved
Survey Unit D (T112A	Exterior)		
Eberline SAC-4 (removable alpha)	13	16	DQO achieved
Eberline BC-4 (removable beta)	13	16	DQO achieved
NE Electra (total alpha and beta)	13	16	DQO achieved
Radiochemical	0	2	DQO achieved

Consistent with the DQO process, the sampling design was optimized through back-calculating actual measurement results (acquired during RLC) and comparing model output with original estimates. The Post Survey Removable Contamination Summary Statistics Calculation verification worksheets for each survey unit are included in Appendices 2,3 and 4. Use of actual sample/survey/scan (result) variances in MARSSIM's DQO model provided confirmation that an adequate number of samples/surveys/scans had been acquired. Inputs required for decision-making, as stated in the original (planning) DQOs, were acquired, including coverage of originally-planned, 3-dimensional boundaries of the structure. All radiological results are valid without qualification, and form data sets with adequate quantities and quality of data for free-release decisions on the three survey units (2 trailers) of interest.

5.2.5 COMPARABILITY

All results presented are comparable with radiological survey/scan and radiochemistry data on a site- and DOE-complex wide basis. This comparability is based on:

Use of standardized engineering units in the reporting of measurement results

- Consistent sensitivities of measurements at approximately 50% or less of the DCGL_W (approximately 50% or less of the DCGL_{EMC} for scans)
- Use of site-approved procedures
- Systematic quality controls
- Thorough documentation of the planning, sampling/analysis process, and data reduction into formats designed for making decisions based on the project's original data quality objectives.

5.2.6 SENSITIVITY

Adequate sensitivities, in units of dpm/100 cm², were attained for all surveys/scans and radiochemical methods implemented based on minimum detectable activities (MDAs) at 50% of the transuranic DCGL_W (\leq 50% DCGL_{EMC} for scans). The nominal MDAs for each survey and radiochemical method are summarized as follows:

- Removable alpha contamination (Eberline SAC-4): 8.3 dpm/100cm²;
- Removable beta contamination (Eberline BC-4): 200 dpm/100cm²;
- Total alpha contamination (NE Electra): 49 dpm/100cm²;
- Total beta contamination (NE Electra): 351 dpm/100cm²;
- Radiochemistry (Alpha Spectrometry): 7.9 dpm/100cm² (converted from 0.119 pCi/g).

5.2.7 OTHER QA ELEMENTS

All personnel performing activities affecting quality within the RLC project were qualified to perform their specific tasks. Suitable training and qualification documentation for personnel performing the work, from the laborers to technical professionals to management, is documented by the RMRS Training Department. In addition, Quality Assurance assessments were limited to the DQA presented in this section; no other site assessments were performed.

5.2.8 DQA SUMMARY

In summary, the data presented in this report have been verified and are qualified as valid and complete for comparison with free-release criteria (action levels) as stated in the DQOs. All media sampled, surveyed and scanned relative to both total and removable alpha activities, yielded results less than action levels for the associated contaminants of concern. Therefore, Survey Units A, C, and D meet the free-release criteria with the statistical confidence stated in this section and throughout the report.

6.0 CLASSIFICATION OF TRAILERS T112A and T112C

Based on the analysis of radiological, chemical and physical hazards, trailers T112A and T112C are classified as Type I Facilities (i.e., "free of contamination") pursuant to the RFETS Decommissioning Program Plan (DPP, K-H, 1998a). Classification was based on a review of historical and process knowledge, historical radiological and chemical data, and newly acquired RLC data. Results indicate no radioactive or chemical contamination exists and no significant physical hazards are present. Trailer 112A contains asbestos as part of the floor tile, which is considered an integral part of the structure.

7.0 REFERENCES

DOE/RFFO, CDPHE, EPA, 1996. Rocky Flats Cleanup Agreement (RFCA), July 19, 1996.

DOE Order 5400.5, "Radiation Protection of the Public and the Environment."

DOE Order 414.1, "Quality Assurance."

EPA, 1994. "The Data Quality Objective Process," EPA QA/G-4.

K-H, 1997. "Kaiser-Hill Team Quality Assurance Program", Rev. 5, 12/97

K-H, 1998a. Decommissioning Program Plan, October 8, 1998.

K-H, 1998b. Facility Disposition Program Manual, MAN-076-FDPM.

K-H, 1999a. Decontamination and Decommissioning Characterization Protocol.

K-H, 1999b. Reconnaissance Level Characterization Plan

MARSSIM – Multi-Agency Radiation Survey and Site Investigation, 12/97 (NUREG-1575, EPA 402-R-97-016).

RFETS, D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report

RFETS Chronic Beryllium Disease Prevention Program, "List of Known Beryllium Areas"

RFETS, Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition

RFETS, Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal

RMRS, 1998. Quality Assurance Program Description, RMRS-QAPD-001, Rev. 2, 4/98

Appendix 1

Historical Site Assessment

Facility Summary

T112A - This unit has been unoccupied since 3/99, it is assembled from five Trailers. The unit was always used for office space, by either Plant Traffic. the Employee Store, Transportation Security, or Telecommunications offices. What is left inside are wall hung fire extinguishers, bolted to wall wooden bookshelves, toilet fixtures in the men/women restrooms, partitions, acoustical ceiling tiles, and the doors are hung. The exterior doors remains and have cipher locks. The exterior doors (4) have wooden weather protection porches. The interior and exterior is in good condition. On the east side of the trailer, approximately 2-3 feet away from the east wall, there is a utility pole, and at the southwest corner there is a de-energized transformer. These are physical hazards that will have to be worked around. when this unit is relocated. From all historical searches, interviews, and historical data located, there has never been any Radioactive material or chemicals stored inside of this trailer. Radiological survey data is not available. However, there is asbestos data available, that indicates there is asbestos containing material in the floor tile.

T112C - This unit has been unoccupied since 1998. It's a singlewide trailer always used as office space. Currently inside, are doors, acoustical ceiling tiles, partitions, wall hung fire extinguishers, and in a separate room there is telecommunication equipment and a fire water riser with controls. The unit is in good condition. However, some siding has been blown loose from the wind. From all historical searches, interviews, and other historical data located, there has never been any Radioactive material or chemical hazards found in any historical data, interviews, or other historical searches, and there are no physical hazards. However, the wood construction at both doors will have to be removed before the trailer is removed.

HISTRORICAL FACILITY OVERVIEW FOR TRAILER T- 112A

- 1.0 This trailer was constructed/assembled at this site, Central Avenue and Fourth Street, behind the northwest corner of Building 112, in the early1960s. The size of this trailer is approximately 45' X 60' and it is assembled from 5 trailer units of approximately 12' X 45' feet in size. There are four doors leading into this trailer, two on the east and two on the west. All of the entry doors are covered; the entry covers range in size from 4' X 4' to 6' X 6'. The siding and the skirting, which is approximately 28" high, around the bottom of the trailer are enamel on aluminum. Structurally the trailer is sound, there are no leaks in the ceiling and the outside has no damage. The foundation that this office trailer sets on is concrete blocks and the tie-down method for the unit is steel cable from the trailers I-beams secured to concrete caissons. The interior outside walls is wood paneling over insulation, the interior partition wall is wood paneling on stud framing, and the floor is carpet and sheet vinyl/linoleum on wood. The ceiling is a drop type with acoustical tile panels up to 12 feet long at various widths. All four doors on this trailer office facility have cipher locks on them.
- 2.0 Prior to the Radio & Pager Operations moving into T-112A, the south half was used for I&ET/Telecommunications offices. The Plant Traffic Department for Plant travel originally occupied the north section of T-112A. The south half of T-112A was a Company Store when the RFETS was operated by Rockwell International (from approximately 1975 to 1990). Later the north section of T-112A was used by Traffic's Transportation Security Office (TSO) Scheduling. Both the I&ET and TSO groups vacated this trailer office building in approximately March, 1999. The trailer has Men and Women restroom facilities. The Men's restroom has a hot water heater for the facility. No other equipment remains in the trailer. Some books and trash remain throughout inside of the trailer. At the present time this trailer is unoccupied and Unoccupied Signs have recently been added to the four entry doors of the facility.
- 3.0 The utilities for this trailer consist of electric heat pumps (5 total) for both heating and air conditioning. T-112A has a smoke detection system and is connected to the Plant Fire Alarm System. A high voltage electrical power transformer is mounted on a concrete pad outside the southwest corner of T-112A. There are no engineering drawings for this trailer. A room layout drawing for this unit is available. Photographs of the exterior and interior of T-112A are available. Radiological surveys may have been done, but data is not available. This trailer will be resurveyed to meet present standards for release. The plant stopped the use of lead based paint in1989, this trailer, if painted before this date may have been painted with lead based paint. Asbestos characterization data exists for the T-112A Unit, according to Kevin Sheehan, X7250, T-452D. No chemicals were used or stored in this trailer. No WSRIC has been done on this trailer. There are no PATS outstanding on this trailer. (See the Facility Planning layout sketch and exterior/interior photographs behind Tab #13 in this Manual.)

Type 1 Facility Checklist

TYPE 1 FACILITY: <u>Trailer</u>	(T112A)
CURRENT LANDLORD: <u>I</u>	RFCSS
DATE OF COMPLETION:	7/15/99

ITEM	YES	NO
Does the facility contain radiological postings?		X
Does the facility contain chemical postings?		X
Are there any installed hazards?		X
Do the historical surveys (radiological and chemical) indicate that the facility is clean?	X	
Are there RCRA units within the facility?		X
Is there a history of the building available?	X	
Is there any equipment/furniture left in the facility? Fire Extngrs., wooden book shelves bolted to walls, toilet fixtures, water heater	X	
Is there a future mission identified for the facility?		X
Will the facility be left unsecured after it is vacated?		X

If any answer to any of the above questions is "Yes", complete the following questions and complete the "graded" PEP in accordance with chapter 2.

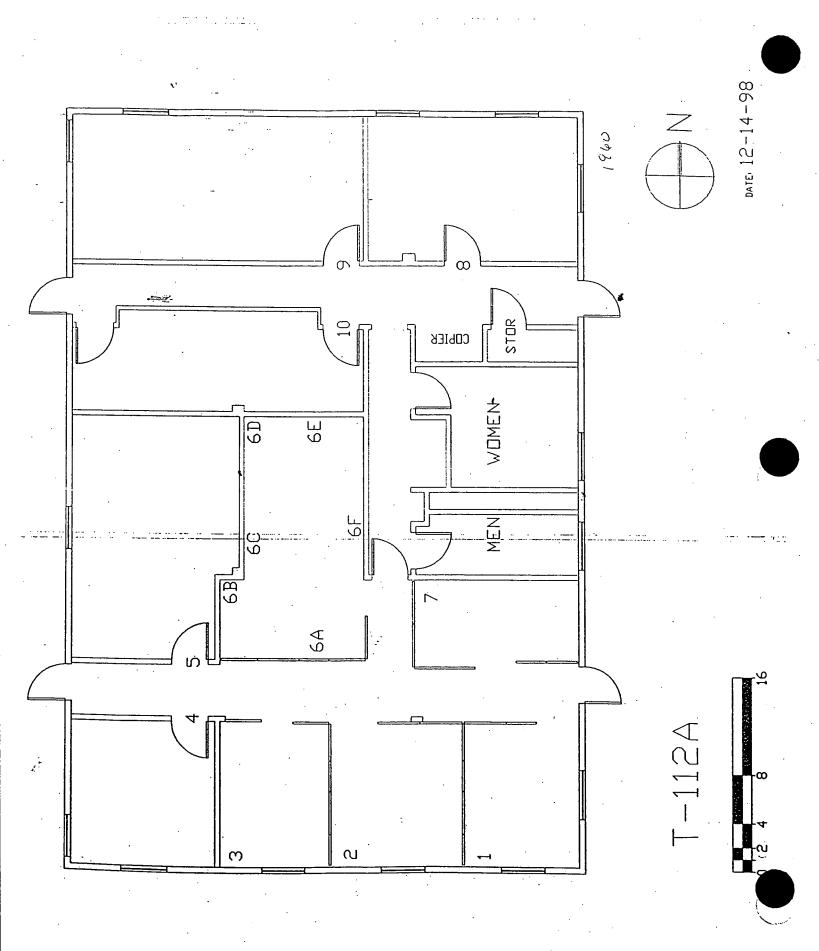
Note: An answer of "Yes" to any question, specifically one dealing with hazards, may indicate the facility is not a Type I Facility. Check with the D&D Programs office.

If the answer to all questions is "No" complete the "graded" PEP in accordance with Chapter 2.

1.	List the Radiological Hazards, location, and quantity: None	•
	Bast on Historical Data found and interviews taken, there are no RAD	~ ~
	hazards in this trailer.	

- List the Chemical Hazards, location, and quantity. None. Based on historical data and interviews taken, there are no chemical hazards in this trailer.
 There is Asbestos Containing Material (ACM) in the floor tile.
- 2. List the Physical Hazards:
 Elec. power pole near middle of east wall and de-energized transformer at the

 Southwest corner



HISTORICAL FACILITY OVERVIEW FOR TRAILER T-112C

- 1.0 This trailer was put in place at this site, Central Avenue and Fourth Street, in 1991. The size of Trailer T-112C is 14' 0" X 60' 3" X 13' 10" at the roof edge (2' 10" is skirting). There are two doors leading into this trailer on the south side with a cipher lock on the west one and a key lock on the east. The entryways are covered with wood panels. The west has wooden steps leading to it and the east has a truck dock and had a handicap access ramp that has been removed. The siding and the skirting around the bottom of the trailer are enamel baked on aluminum. Structurally the outside has a panel that has been torn loose and part of it has blown away, inside its condition is good. The interior outside walls is vinyl over 4' by 8' dry wall over insulation, the interior partition walls are the same materials on stud framing. The ceiling is a drop type with 2' by 4' acoustical tile panels and the floor is carpet over wood flooring.
- 2.0 This trailer has been used as offices all the time it has been on site. There are 6 hard walled rooms of which 5 are offices. The sixth contains the telecommunication equipment and the fire sprinkler controls. The last occupant was Wackenhut Services which, used it as a scheduling office. They moved out in1998. At the present time the trailer is unoccupied and Unoccupied Signs have recently been added to the two doors of the facility.
- 3.0 The utilities for this building are an electric heat pump for heating and cooling, a fire sprinkler system, and it is connected to the plant fire alarm and PA systems. The drawings for this trailer consist only of a Facility Planning lay out sketch. Radiological surveys may have been done, but the data is not available. This unit will be resurveyed to meet present standards for release. Asbestos characterization data exists for the T-112C Unit, according to Kevin Sheehan, X7250, T-452D. The tie down method and the support structure underneath is unknown because of the skirting all around the bottom. The plant stopped the use of lead based paint in 1989. This trailer if painted before this date may have been painted with lead based paint. No chemicals were used or stored in this trailer. No WSRIC has been done on this trailer. There are no PATS outstanding on this trailer. (See the Facility Planning sketch behind Tab #13 in this Manual. Plant site aerial photos and outside and inside photos are behind Tab #13.)

Type 1 Facility Checklist

TYPE 1 FACILITY: Trailer	(T112C)
CURRENT LANDLORD: 1	RFCSS
DATE OF COMPLETION:	7/15/99

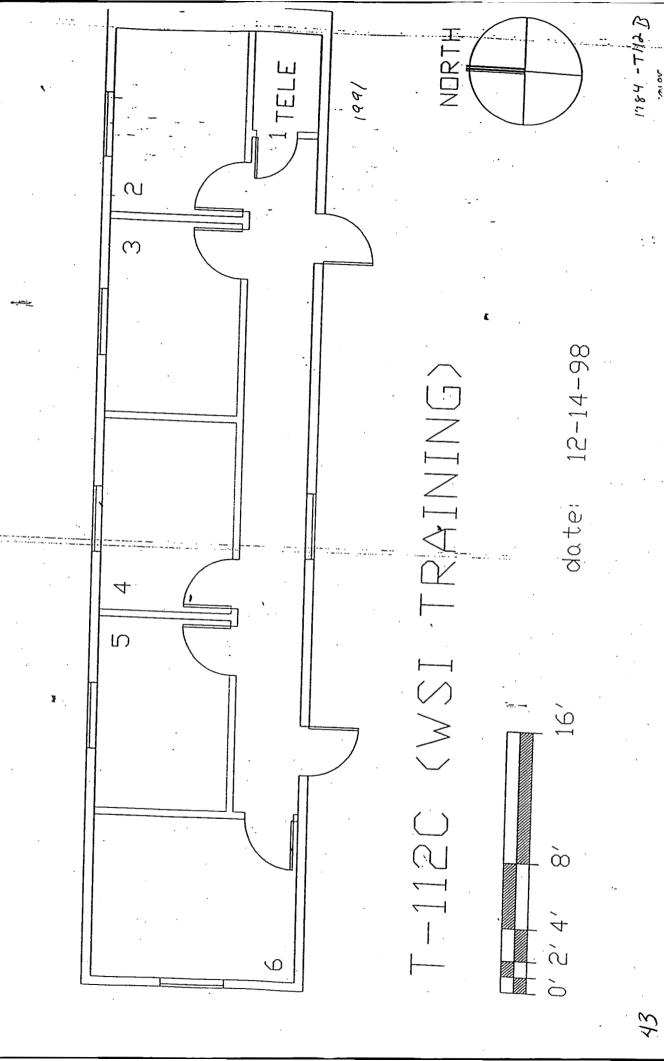
ITEM	YES	NO
Does the facility contain radiological postings?		X
Does the facility contain chemical postings?		X
Are there any installed hazards?		Х
Do the historical surveys (radiological and chemical) indicate that the facility is clean?	X	
Are there RCRA units within the facility?		X
Is there a history of the building available?	X	
Is there any equipment/furniture left in the facility? Fire Extgrs.	X	
Is there a future mission identified for the facility?		X
Will the facility be left unsecured after it is vacated?		X

If any answer to any of the above questions is "Yes", complete the following questions and complete the "graded" PEP in accordance with chapter 2.

Note: An answer of "Yes" to any question, specifically one dealing with hazards, may indicate the facility is not a Type 1 Facility. Check with the D&D Programs office.

If the answer to all questions is "No" complete the "graded" PEP in accordance with Chapter 2.

List the Radiological Hazards, location, and quantity: Based on Historical data found and interviews taken, there are no known RAD
Hazards in this trailer
List the Chemical Hazards, location, and quantity: Based on Historical Data found and interviews taken, there are no known
Chemical hazards in this trailer
List the Physical Hazards: None



Appendix 2

Radiological Survey Data for Interior of Trailer T112A (Survey Unit A)

Appendix 2

Radiological Survey Data for Interior of Trailer T112A (Survey Unit A)

APPENDIX 2 - Survey Unit A (Interior T112A)

- Survey Unit A Data Summary
- MARSSIM Calculation/Verification Worksheet
- Total and Removable Radiological Survey Results
- Performance Test Logs
- Survey Package Cover Sheet
- Sampling and Survey Instructions
- Grid Survey Maps

Total Alpha

Survey Unit A Data Summary - T112A Interior

August 18, 1999

standard deviation: 6.333772

max:

5.0

Instrument background:

3 cpm

mean:

-6.125

-14.0 min:

Instrument efficiency:

21.9 %

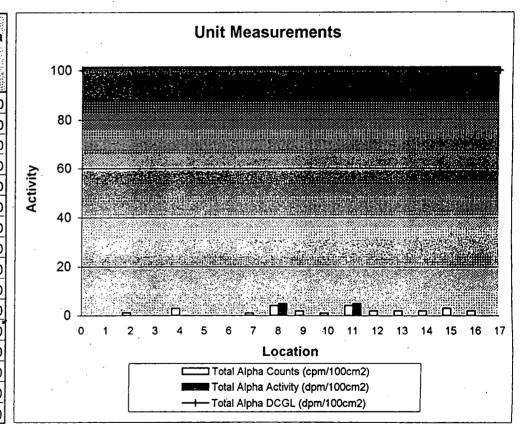
median:

-5

Instrument MDA:

49 dpm

	Surface	-		Grid Location	Counts	Total Alpha Activity (dpm/100cm²)	DCGL
1	Room	1	Wall	!1	0	-14	100
2	Room	2	Wall	P2	1	-9	100
3	Room	4	Floor	A6	0	-14	100
4	Room	4	Ceilling	A4	. 3	0	100
5	Room	4	Ceilling	A6	0	-14	100
6	Room	5	Wall	H2	0	-14	100
7	Room	6	Floor	A1	1	-9	100
8	Room	6	Ceilling	B1	4	5	100
9	Room	6	Wall	H2	2	-5	100
10	Room	8	Wali	Q1	1	-9	100
11	Room	8	Wall	R2 .	4	5	100
12	Room	9	Floor	А3	2	-5	100
13	Room	-9	Ceilling	B4	2	-5	· 100
14	Room	10	Ceilling	C2	2	-5	100
15	Room	11	Wali	K1	3	0	100
16	Room	12	Wall	K2	2	-5	100





Survey Unit A Data Summary - T112A Interior

August 18, 1999

standard deviation:

169.876

max:

-277.0

Instrument background: 495 cpm

mean:

median:

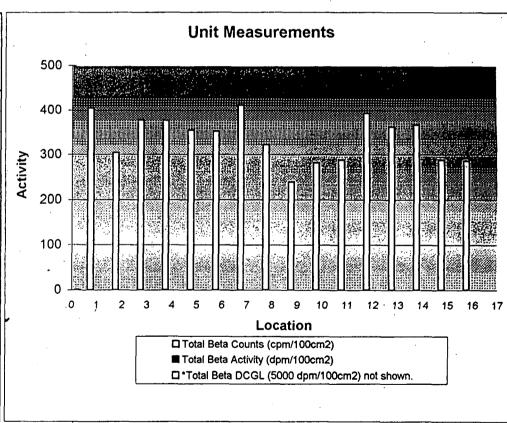
-518.5 -468.5 min:

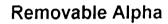
-845.0

Instrument efficiency: 30.3 %

Instrument MDA: 351 dpm

	Surface	Lo	cation	Grid Location	Counts	Total Beta Activity (dpm/100cm²)	DCGL
1	Room	1	Wali	<u> </u>	405	-297	5000
2	Room	2	Wall	P2	304	-630	5000
3	Room	4	Floor	A6	377	-389	5000
4	Room	4	Ceilling	A4	376	-393	5000
5	Room	4	Ceilling	A6	354	-465	5000
6	Room	5	Wall	H2	352	-472	5000
7	Room	6	Floor	A1	411	-277	5000
8	Room	6	Ceilling	B1	322	-571	5,000
9	Room	6	Wall	H2	239	-845	5000
10	Room	8	Wall	Q1	282	-703	5000
11	Room	8	Wall	R2	288	-683	5000
12	Room	9	Floor	А3	393	-337	5000
13	Room	9	Ceilling	B4	362	-439	5000
14	Room	10	Ceilling	C2	367	-422	5000
15	Room	11	Wall	K1	288	-683	5000
16	Room	12	Wall	K2	286	-690	5000



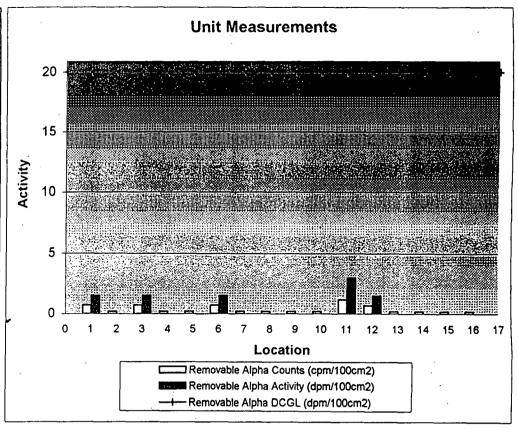


Survey Unit A Data Summary - T112A Interior

August 18, 1999

standard deviation:	0.928709	max:	3.0	Instrument background:	0.2 cpm
mean:	0.5625	min:	0.0	Instrument efficiency:	33 %
median:	0		, '	Instrument MDA:	7.6 dpm

	Surface	Lo	cation	Grid Location		Removable Alpha Activity (dpm/100cm²)	DCGL
-1	Room	1	Wall	11	1	1.5	20
2	Room	2	Wall	P2	0	0	20
3	Room	4	Floor	A6	1	1.5	20
4	Room	4	Ceilling	A4	. 0	0	20
5	Room	4	Ceilling	A6	0	0	20
6	Room	5	Wall	H2	1	1.5	20
7	Room	6	Floor	A1	0	. 0	20
8	Room	6	Ceilling	B1	0	0	20
9.	Room	6	Wall	H2	0	0	20
10	Room	8	Wall	Q1	Ö	0	20
11	Room	8	Wall	R2	· 1	3	20
12	Room	9	Floor	А3	1	1.5	20
13	Room	9	Ceilling	B4	0	0	20
14	Room	10	Ceilling	C2	0	0	20
15	Room	11	Wall	K1	0	0	20
16	Room	12	Wall	K2	0	0	. 20



Survey Unit A Data Summary - T112A Interior

Removable Beta

70.00	40 cpm	25 %	200 dpm	
	instrument background: 40 cpm	Instrument efficiency:	Instrument MDA: 200 dpm	
	28.0	-44.0		
	max:	min:		
	20.12627	mean: -6.5	c	,
	standard deviation: 20.12627	mean	. c.; c.;	HECHAIL

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Remov Beta Ac (dpm/100					•			,	œ-	-28	-16	0	-44	28	8-	
Removable Removable Beta Counts Beta Activity (cpm/100cm²) (dpm/100cm²)	40	47	40	40	32	32	40	41	38	33 -28	36 -16	40 0	2944	47 28	38 -8	41
rid Removable Remation Beta counts Beta com/100cm³) (dpm	- 4		A6 40	A4 40			A1 40						B4 . 29	C2 47		K2 41
Grid Removable Rem Location (cpm/100cm²) (dpm	1	P2 47	A6	A4	A6 32	H2 32	A1	B1 41	H2 38	Q1 33	R2 36	A3 40	B4 . 29	C2 47	K1 38	.K2
Grid Removable Rem Location Gena Counts Beta (cpm/100cm²) (dpm	Wall 11	Wall P2 47	Floor A6	Ceilling A4	Ceilling A6 32	Wall H2 32	Floor A1	Ceilling B1 41	Wall H2 38	Wall Q1 33	Wall R2 36	Floor A3 40 ·	B4 . 29	C2 47	Wall K1 38	Wall K2
Grid Removable Rem Location Gena Counts Beta (cpm/100cm²) (dpm	1 Wall 11	2 Wall P2 47	4 Floor A6	4 Ceilling A4	4 Ceilling A6 32	5 Wall H2 32	6 Floor A1	6 Ceilling B1 41	6 Wall H2 38	8 Wall Q1 33	8 Wall R2 36	9 Floor A3 40	9 Ceilling B4 29	10 Ceilling C2 47	11 Wall K1 38	12 Wall K2
Surface Location Grid Removable Remov Surface Location Location Com/100cm? Com/100	1 Wall 11	2 Wall P2 47	Floor A6	Ceilling A4	Ceilling A6 32	Wall H2 32	Floor A1	Ceilling B1 41	Wall H2 38	Wall Q1 33	Wall R2 36	Floor A3 40 ·	B4 . 29	C2 47	11 Wall K1 38	Wall K2

Survey Area: T112 **Building:** T112A

Survey Unit: A (T112A Interior)

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit A removable surface contamination data are calculated on the "Survey Unit A Data" sheet. Because all removable survey measurement results are less than DCGLw (alpha less than 20 dpm/100 cm², beta less than 1000 dpm/100 cm²), the survey unit clearly meets the removable contamination release criterion.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta =$ 0.05. The number of sample points calculated was based on the use of this test.

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGLw. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGLw.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of smears with the ACTUAL survey unit standard deviation.

The actual removable survey standard deviations for Unit A are: a 0.93

Thus, the ACTUAL required number of measurements is as follows:

 $\Delta/\delta = (DCGL_{REMOVABLE} - LBGR_{REMOVABLE})/SD_{REMOVABLE}$

 $\Delta/\delta_{\text{transuranics}} = (20 \text{ dpm}/100 \text{cm}^2 - 10 \text{ dpm}/100 \text{cm}^2)/\frac{0.93}{0.93} \text{ dpm}/100 \text{cm}^2 = 11$

 $\Delta/\delta = (DCGL_{REMOVABLE} - LBGR_{REMOVABLE})/SD_{REMOVABLE}$

 $\Delta/\delta_{\text{transuranics}} = (1000 \text{ dpm}/100 \text{cm}^2 - 500 \text{ dpm}/100 \text{cm}^2)/20.1 \text{ dpm}/100 \text{cm}^2 = 24.9$

Where:

Δ/δ

is the relative shift or the resolution of measurements in units of measurement

uncertainty

DCGL REMOVABLE is the removable surface contamination derived concentration guideline value (DOE Order 5400.5

removable surface contamination limit equals 20 dpm/100cm² for transuranics per the T112A-C Pre

Demolition Survey Plan)

LBGR REMOVABLE

is the lower bound of the gray region - the lower bound of the range of values of the parameter of

interest in a survey unit where the consequences of making a decision error is relatively minor (set equal

to value utilized in original sample size calculation).

SD REMOVABLE

is the ACTUAL standard deviation of the removable surface contamination measurements

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112 Building: T112A

Survey Unit: A (T112A Interior)

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of removable surface contamination measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on radioactive contaminants of concern not being present in the background:

 α N = $(1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$ N = $(1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = \underline{10.9}$

β N = $(1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$ N = $(1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = \underline{10.9}$

Where: 1.645

is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

N = 10.9 * 1.2 = 13

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of $\underline{13}$ α and β Removable Surface Contamination measurements were required in Unit A.

Step 4:

Draw conclusions from the data: All measurements are less than DCGL_w. The minimum number of required removable survey measurements were collected. Thus, survey unit <u>Unit A</u> complies with the removable contamination release criteria.

Survey measurements were estimated	aao, oa o		
DAVID A BARNES		OAQ-	8-18-99
Prepared By: Printed Name	Employee #	Radiológical Engineer Signature	Date
MERWICS		Matakulu	8/18/99
Reviewed By: Printed Name	Employee #	Radiological Engineer Signature	✓ Date

Survey Area: T112 Building: T112A

Survey Unit: A (T112A Interior)

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the <u>Unit A</u> data are calculated on the "<u>Survey Unit A Data</u>" sheet. Because all total surface activity (TSA or TSC) measurement results are less than DCGLw (less than 100 dpm/100 cm²), the survey unit clearly meets the TSA release criterion.

A graphical data review was also performed on the attached form. The posting plot indicated that spatial trends of elevated areas are not present. The histogram indicated that no isolated areas of elevated activity are present.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with α = 0.05 and β = 0.05. The number of sample points calculated (see "Total Surface Activity Measurement Calculation Worksheet") was based on the use of this test. A local area background (LAB) value was subtracted from each gross measurement to calculate a net result, thus the sign test applies (sign test is typically applied only when the contaminant is not present in background).

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGLw. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGLw.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of samples with the ACTUAL survey unit standard deviation.

The actual total surface contamination standard deviations for Unit A are: $\alpha \underline{6.3}$ $\beta \underline{170}$

Thus, the ACTUAL required number of samples is as follows:

 $\Delta/\delta = (DCGL_{TSA} - LBGR_{TSA})/SD_{TSA}$

 α $\Delta/\delta_{\text{transuranics}} = (100 \text{ dpm}/100 \text{cm}^2 - 50 \text{ dpm}/100 \text{cm}^2)/\frac{6.3}{6.3} \text{ dpm}/100 \text{cm}^2 = \frac{7.9}{6.3}$

 β $\Delta/\delta_{transuranics} = (5000 \text{ dpm}/100 \text{cm}^2 - 2500 \text{ dpm}/100 \text{cm}^2) / \frac{170}{170} \text{ dpm}/100 \text{cm}^2 = \frac{316}{100}$

Where:

 Δ/δ is the relative shift or the resolution of measurements in units of measurement

uncertainty

DCGL TSA is the total surface Activity derived concentration guideline value (DOE Order 5400.5 total surface

Activity limit equals 100 dpm/100cm² for transuranics and 5000 dpm/100cm² for uranium, per the

T112A-C Pre Demolition Survey Plan)

LBGR TSA is the lower bound of the gray region – the lower bound of the range of values of the parameter of

interest in a survey unit where the consequences of making a decision error is relatively minor (set equal

to the value utilized in the original sample size calculation).

SD_{TSA} is the ACTUAL standard deviation of the total surface Activity

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area:	T112	Building:	T112A	•
Survey Unit:	A (T112A Interior)			

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of TSA surface Activity measurements for the applicable survey unit using the following

MARSSIM, Section 5.5.2.3 formula that is based on Plutonium contaminants not being present in the background:

 α and β

 $N = (1.645 + 1.645)^2 / 4(Sign P - 0.5)^2$

 $N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = 10.9$

Where:

1.646

is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition

Survey Plan

Sign P

equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

N = 10.9 * 1.2 = 13

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 Total Surface Activity measurements were required in Unit A.

Step 4:

Draw conclusions from the data: All measurements are less than DCGLw. The minimum number of required TSA

measurements were collected. Thus, survey Unit A complies with the TSA release criteria.

DAVID A. BAZZLES		SAM	8-18-99
Prepared By: Printed Name	Employee #	Radiological Engineer Signature	Date
ESTABROOKS		1 H Estatudu	8/24/99
Reviewed By: Printed Name	Employee #	Radiological Engineer Signature	Date

T112A interior MDA

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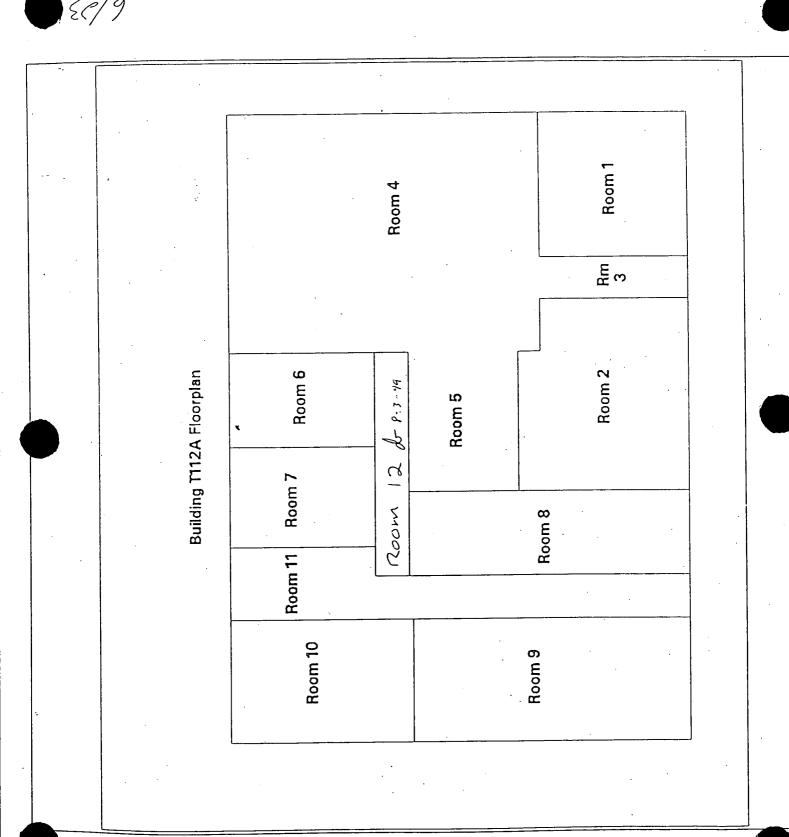
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CONTINUATION SHEET

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, i				Electr	a Perfoance	e Test Lo	g			
	Instrument Se	rial Number		Instrum	ent Efficiency	Alpha	21.9%	70_	Beta	30.3%
	1255			Inst	rument Calib	ration Du	e Date 9	-16-99		
Source Serial Nu	ımber	Calibration Due Da	te	Source A	ct. (dpm)	Ţ	Source Acct.	(cpm)		cceptable Range (sq)
68014	1 ×	WIA	.		24830		50	138	4350	to 6525
	<u> </u>				22770	100	7.0	399	- r.c	to 8279
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6039	276	NA			22723		68	385	5508	to 8262
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	17.5774	AT DITA D d'	A T DYTA	BETA	BETA Reading	BETA	RCT Emplo	T	CT NAME	RCT Signature
Date	ALPHA BKGD3	ALPHA Reading (Corrected cpm)3	ALPHA Pass/Fail	Bkgd 3	(Corrected cpm)3	Pass/Fail	Number		(Print)	. C1 Signature
7129199	2	4970	PUSS	444	6633	Pass			Munoz_	Trese
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1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).

REVIEWED BY:

RO SUPERVISOR PRINT NAME

18-

RO SUPERVISOR SIGNATURE

DATE

3. All counts are to be 1 minute in duration.

If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

NOTE

ROCKY FLATSENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER P	ERFORMANCE LOC :
INSTURMENT MODEL: (Circle One)	ALPHA BETAIL
SACA BC4/LUDLUM 2929 · Counter Serial No.	835 Calibration Due Date: 20-26-90
GACATECATEODEON 2525 Counter Schartes	Building: 549 Location: Biffied
Start Date: 8-9-99 End Date: 8-15-99	
Source: SN 680141 D. P. M .: 248	Shill P4 Gross Source cpm:
Shift All Cross Source com:	Time: Bl.c. cpm:
RCT Emp. # Net Source cpm:	RCT Emp. * Net Source epm:
%Error:	(Prior Name / Signature)
(Print Name / Signature) Child D1 Gross Source cpm: 7403	Shile MS Comes Source cpan:
Time: 06131 Big.com: 0.1	. Time: Bkg. cpm: Nct Source cpm:
Set Source com: 7403	RCT Emp. 4
(Print Name / Stranger)	(Print Name / Signature)
Shift P1 Cross Source cpm:	Spill DS Cross Source chan: 7053
Time: Bug. cpm:	RCT Emp. # Net Source cpm: 1053
RCT Emp. # Net Source cpm:	LAGENT Amo I Harry sigaror -13,9
(Print Name / Signature)	(Print Name / Sifasture)
Shift M2 Cross Source cpm:	-Shift PS Gross Source cpm:
Time: Big.cpm:	RCT Emp. F Net Source cpm:
RCT Emp. F Net Source epm:	%Error:
(Print Name / Signature)	(Print Name / Signature) Stift M6 Gross Source cpm:
if D2 · Cross Source cpm: 7081	Spit Me Coar Source char:
TEMP. 5 1080 Big. cpm: 0.2	RCT Emp. # Net Squirec cpm:
Land (The supple of the supple of Error -1313.	7.2100
(Print Nemc/Signature)	(Priat Name / Seguature) Shift D6 Cross Source cpm:
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%Error:	Print Name / Signatures
(Print Name / Signature)	Shift P6 Cross Source cpm:
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%Error:	(Prior Name / Signature)
(Print Name / Signature) Shift D3 Gross Source cpm: 6860	Shift M7 Cross Source cpm:
Time: 0630 Bkg.cpm: 02	Time: Btg. cpm:
RCT Emo. F Net Source cpm: 6868	RCT Emp. # Nct Source cpm: "Error:
(Print Name / Signature)	(Print Name / Signature)
Shift P3 Cross Source cpm:	Shift D7 Cross Source cpm:
Time: 8ke.cpm:	Time: Btg. cpm:
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(Print Name / Signiture)	(Scint Name / Signature)
Shill M4. Cross Source cpm:	Shift P7 Gross Source cpm:
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RCT Emp. F Net Source cpm: 7/Error:	**Eccor:
(Print Name / Signature)	(Print Name / Signature)
ist D4 Cross Source cpm: /2876	% ERROR= (Net cpm/E)-Source dpm , 100
TEMP 5 NCI Squeece cpm: 6436	% ERROR= Little Control of the Contr
	Source dpm
(Print Name / Sighalure)	Net cpm = gross - background cpm
E = Efficiency=0.11 for the SAC-1 and 0.25 for the BC-1	
11 CN Cooper	7. 100411/

Best Available Copy

Emp. # 2410

ROCKY FLATSENVIRONMENTAL TECHNOLOGY SITE

	SWIPE COUNT	TER P	ERFORMANCE LO	
INSTURMENT MOD)FL: (Circle One)		•	ALPHA D BETA D
1	CIAC 2020 . Counter Secial	No.	. 824	Calibration Due Date: 10-13-95
SAC-AIRCAI CODE	G End Date: 8-22	-99	Building: 54	9 Location: office
Siari Daic: 0-16-7	Enn Date. O- D-	5 U a	30 Cc0	tilication Due Date: WA
Source: SN 6001		210		⨯ Source chu:
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in D2	Cross Source cpm: 127	<u> </u>	Time	Btc. cpa:
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(Print Name / Signature)	Cross Source cpm:		Shift D7	Cross Source cpm:
Finc:	8kz. cpm:		Time:	Btc.cpm:
RCT Emp. 6	Net Source com:		RCT/Emp	Na Source apm:
	%Error:]	(Spint Name / Signature	
(Print Name ! Signature)			Shift P7	Cross Source cpm:
Shift M4,	Cross Source com:	 \	Time:	Bte.cpm:
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ift D4	Cross Source cpm:		WEDDON- (Net c	pm/E)-Source dpm x 100
nc:	Btg.cpm:	— <u>·</u> ·[% EICKOR= Little	<u> </u>
_T Emp. #	Net Source cpm:			Source dpm
	/·Ciror	-	:Yet cpm	= gross - background cpm

(Print Name / Signature)

E = Efficiency=011 for the SAC-1 and 0.25 for the BC-1

Approved by : UN Cooper

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Emio.#

8-17-79 0210

---ROCKY FLATSENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER P	EIG-OIGWVIACE FOC
	ALPHA BETA B
INSTURMENT MODEL: (Circle One)	No. tan Dar D
Suc A VOC A LO HIDT HIM 7979 . " Counter Serial No. 1	770 Calibration Due Date: 1-2-00
SACA (BCA) COBCOM ESTE	Building: 549 Location: Office
Start Date: 8-9-99 End Date: 8-15-99	23 Certification Due Date: NA
Source: SN 603927 D. P. M.: 227	Comments of the second
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file com	Time: Btg. cpm:
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KCI Emp. >	%Error.
(Print Name / Signature)	· (Prior News / Signature)
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RET Emp. " Nyl Source com: 5345	RCT Emp. 5 Yet Source cpm: "KError:
LINGENK AWAY / DENVERNIPLICOR -5,9	
(Prial Name / Securior)	(Print Nemc / Segueture)
Shift P1 Gross Source cpm:	Shift DS Cross Source cpm: 5159
Time: Big.cpm:	(inc: 00 = 170
RCT Emp. " Net Source cpm:	
%Error:	Stream KAME / Sauris Hages4,8
(Print Name / Signature)	(Print Name / Signature)
Shift M2 Gross Source cpm:	Shift PS Cross Source cpm:
Bly.cpm:	Time: Btc. cpm:
RCT Emp. # Net Source cpm:	RCT Emp. F Net Source epm: Y. Eccors
%Ecoc.	
(Priat Name / Signature)	(Prior Name / Signature)
Cross Source cpm: 5/82	Shirt M6 Cross Source cpa:
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TEmp. # Ngi Source com: 5143	RCT Emp. # %cr Source com:
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%£rror	(Print Name / Signature)
(Print Name / Signature)	C. Ccom
Shift MD Cross Source cpm:	Shift P6 Cross Source chair. Time: 8kc. cpm:
Time: Bkg.cpm:	Not Source com:
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POCKY FIATS ENVIRONMENTAL TECHNOLOGY SITE

SMILE CODISTER LE	
	ALPHA BETA PA
INSTURMENT MODEL: (Circle One)	100 Calibration Due Date:
Counter Serial IVO-1.	
Start Date: 8-9-99 End Date: 8-15-99	
Start Date: Day 77	23 Certification Due Date: 1/14
Source: SIN 603927 D. P.M.: 2272	Shill P4 Cross Source cpm:
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Gross Source cpm:	Time By com:
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Car South Charles	7.61101
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(Print Name / September)	Shift D6 Gross Source cpm:
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(Print Name / Signature) Cons Source Com: 5299	Shift M17 Cross Source cpm:
CCC 1011	Time: Btg. cpm:
Time: UO St	RCT Emp. 6 . Nct Source cpm:
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RCT Emp. # Net Source cpm:	RCT Emp. "
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if D4 Cross Source cpm: 3259	% ERROR= (Net cpm/E)-Source dpm x 100
nc: 8620 8kg.cpm: 47	% FICKUR=
Nei Source cpm:	Source dpa
HYSSYPAMO/ HASINEAND ". C. COC: -812	Nct cpm = gross · background cpm
(Print Name (Stratige)	<u></u>
E = Efficiency=011 for the SACH and 0.25 for the BCH	~ .7
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Best Available Copy

Survey Area: T112 Survey Unit: Unit A Building: T112A Survey Unit Description: Office trailer – Pre Demolition Survey

SURVEY PACKAGE COVER SHEET

Building Information		
Classification: Type 1 🗵 Type 2 🔲	- 	
Classification. Type I Ex Type 2 Ex T	уре 3 🗀	
Contaminants of Concern: Plutonium	Liranium XI Other T	
		·
Special Support Requirement Survey points randomly generated by Ra		
Salvey points randomly generated by the	adiological Engineering	
Special Safety Precautions		
	tion Monitoring Requirements" and IWCP	
Labeling Requirements		
Not Applicable		
Survey Package Implemen	tation	
		•
This survey package is ready for implen	nentation	
	0.4-	2
D. A. BARNES	2 de la companya della companya della companya de la companya della companya dell	8-3-99
Radiological Engineer Printed Name	Radiological Engineer Signature	Date
H.B.ESTABROOKS	Mortalaula	8/3/98
RE Peer Review Printed Name	RE Peer Review Signature	Date
Survey Package Closure		
All required reviews are complete, and a authorized for closure.	data analysis results meet RLCP criteria. Survey p	ackage is
Radiological Engineer Printed Name	Radjølogical Engineer Signature	Date
Sai Establica	Mesterfacho	8/18/99
RE Manager Printed Name	RE Manager Signature	Date

Survey Area: T112 Survey Unit: Unit A Building: T112A

Survey Unit Description: Office trailer – Pre Demolition Survey

SAMPLING AND SURVEY INSTRUCTIONS

Measurement	Amount & Type	Comments			
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed.			
	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.			
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m ² scan surveys will be performed at locations indicated.			
•		Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.			
	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT			
Media Samples:	None	None			
Volumetric Samples:	None	None			

EC/9

-						
			Room 4			Room 1
						B _w
	A Floorplan	Room 6	D- 8-3-99	Room 5		Room 2
	Building T112A Floorplan	111 Room 7	200m 12		Room 8	
	•	Room 11				
		Room 10			Room 9	

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Appendix 3

Radiological Survey Data for Exterior of Trailer T112A (Survey Unit D)

APPENDIX 3 - Survey Unit D (Exterior T112A)

- Survey Unit D Data Summary
- MARSSIM Calibration/Verification Worksheet
- Total and Removable Radiological Survey Results
- Performance Test Logs
- Survey Package Cover Sheet
- Sampling and Survey Instructions
- Grid Survey Map
- Laboratory Radiochemistry Results
- Chain of Custody



Survey D Unit Data Summary - T112A Exterior

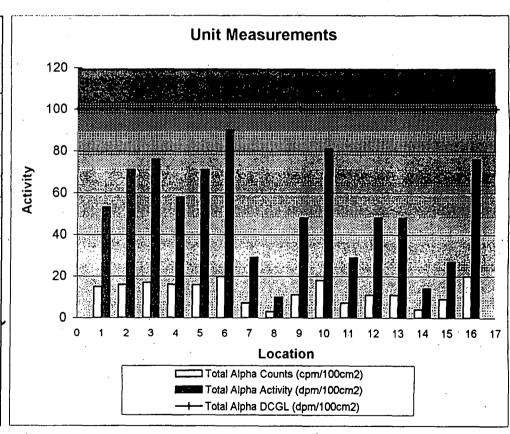
August 19, 1999

 standard deviation:
 24.67717
 max:
 90.0
 Instrument background:
 1 cpm
 3 cpm

mean: 51.8125 min: 10.0 Instrument efficiency: 21.0 % 22.5 %

median: 50.5 Instrument MDA: 33 dpm 48 dpm

	Surface	Lo	cation	Grid Location	Total Alpha Counts (cpm/100cm²)	Total Alpha Activity (dpm//100cm²)	Total Alpha DCGL (dpm/100cm²)
1	Exterior		Roof	A2	. 15	53	100
2	Exterior		Roof	E3	16	71	100
3	Exterior		Roof	E5	17	76	100
4	Exterior		Roof	G3	16	58	100
5	Exterior		Roof	M8	16	71	100
. 6	Exterior		Roof	N7	20	90	100
7	Exterior	2	Wall	12	7	29	100
8	Exterior	2	Wall	K3	3	10	100
9	Exterior	2	Wall	О3	11	48	100
10	Exterior	2	Wall	B1	18	81	100
11	Exterior	N	Wall	A1	. 7	29	100
12	Exterior	Ν	Wall	D1	11	48	100
13	Exterior	Ν	Wall	C3	11	48	100
14	Exterior	S	Wall	E3_	4	14	100
15	Exterior		Roof	R5	9	27	100
16	Exterior		Roof	A6)	20	76	100



Total Beta

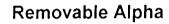
Survey D Unit Data Summary - T112A Exterior

August 19, 1999

294 dpm 346 cpm 30.4 % 8/19/99 08/10/99 379 cpm Instrument MDA: 288 dpm Instrument efficiency: 32.4 % Instrument background: -256.0 336.0 max: min: standard deviation: 153.1643 mean: 73.3125 66.5

median:

Unit Measurements	- 009										0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	Location	☐ Total Beta Counts (cpm/100cm2) ■ Total Beta Activity (dpm/100cm2)	□ *Total Beta DCGL (5000 dpm/100cm2) not shown.		
)9	22	,			ito/	7	í 	10				x				
Total Beta DCGL (dpm/100cm²)	5000	2000	2000	2000	2000	2000	2000	2000	5000	2000	2000	2000	2000	2000	2000	2000
	-43	262	278	26	336	151	-12	188	154	-256	66	59	74	-74	0	69-
Total Beta Total Beta Counts Activity (dpm/100cm²) (dpm/100cm²)	333	464	469	354	488	428	375	440	429	296	411	368	403	355	346	325
Grid	A2	E3	E5	63	M8	N7	12	K3	03	B1	A1	D1	. C3	E3	R5	A6
cation	Roof	Roof	Roof	Roof	Roof	Roof	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Roof	Roof
Surface Location Location	Exterior 2	Exterior 2	Exterior 2	Exterior 2	Exterior N	Exterior N	Exterior N	Exterior S	Exterior	16 Exterior						
	-	7	က	4	ည	ဖ	2.	∞	ნ	9	7	12	13	14	15	16

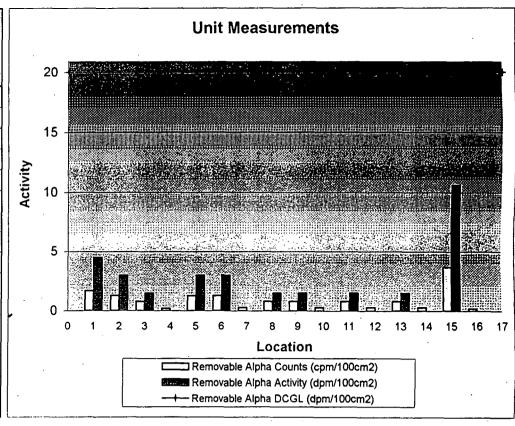


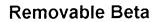
Survey D Unit Data Summary - T112A Exterior

August 19, 1999

					08/10/99	8/19/99
standard deviation:	2.688866	max:	10.6	Instrument background:	0.3 cpm	0.2 cpm
mean:	1.975	min:	0.0	Instrument efficiency:	33 %	33 %
median:	1.5			Instrument MDA:	8.3 dpm	7.5 dpm

	Surface			Grid Location	Alpha Counts		DCGL
1	Exterior		Roof	A2	2	4.5	20
2	Exterior		Roof	E3	1	3	20
3	Exterior		Roof	E5	1	1.5	20
4	Exterior		Roof	G3	0	. 0	20
5	Exterior		Roof	M8	1	3	20
6	Exterior		Roof	N7	1	. 3	20
7	Exterior	2	Wall	12	0	. 0	20
8	Exterior	2	Wall	K3	1	1.5	20
. 9	Exterior	2	Wall	O3	1	1.5	20
10	Exterior	2	Wall	B1	0	. 0	20
11	Exterior	Z	Wall	A1	1	1.5	20
12	Exterior	N	Wall	D1	0	0	20
13	Exterior	Ν	Wall	C3	1	1.5	20
14	Exterior	s	Wall	E3	0	0	20
15	Exterior		Roof	R5	4	10.6	20
16	Exterior		Roof	A6	0	0	20



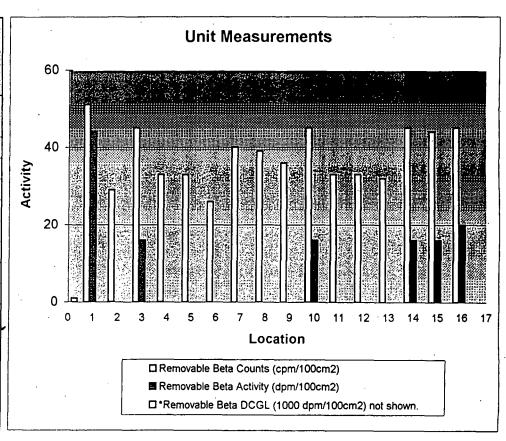


Survey D Unit Data Summary - T112A Exterior

August 19, 1999.

			•	08/10/99	8/19/99
standard deviation:	29.49237	max: 44.0	Instrument background:	41 cpm	40 cpm
mean:	-10.75	min: -60.0	Instrument efficiency:	25 %	25 %
median:	-14		Instrument MDA:	200 dpm	200 dpm

	Surface	Lo	cation	Grid Location	Removable Beta Counts (cpm/100cm²)	Removable Beta Activity (dpm/100cm²)	Removable Beta DCGL (dpm/100cm²)
1	Exterior	L	Roof	A2	51	44	1000
2	Exterior		Roof	E3	29	-48	1000
3	Exterior		Roof	E5	45	16	1000
4	Exterior		Roof	G3	33	-28	1000
5	Exterior		Roof	M8	33	-32	1000
6	Exterior		Roof	N7	26	-60	1000
7	Exterior	2	Wall	12	40	-4	1000
8	Exterior	2	Wall	КЗ	39	-8	1000
9	Exterior	2	Wall	O3	36	-20	1000
10	Exterior	2	Wall	B1	45	16	1000
11	Exterior	Ν	Wall	A1	33	-32	1000
12	Exterior	Ν	Wall	D1	33	-32	1000
13	Exterior	N	Wall	С3	32	-36	1000
14	Exterior	s	Wall	E3	45	16	1000
15	Exterior		Roof	R5	44	16	1000
16	Exterior		Roof	A6	45	20	1000



Survey Area: T112 Building: T112A

Survey Unit: D (T112A Exterior)

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the <u>Unit D</u> removable surface contamination data are calculated on the "<u>Survey Unit D Data</u>" sheet. Because all removable survey measurement results are less than DCGL_W (alpha less than 20 dpm/100 cm², beta less than 1000 dpm/100 cm²), the survey unit clearly meets the removable contamination release criterion.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with α = 0.05 and β = 0.05. The number of sample points calculated was based on the use of this test.

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGL_w. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGL_w.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of smears with the ACTUAL survey unit standard deviation.

The actual removable survey standard deviations for <u>Unit D</u> are: $\alpha = 2.69 - \beta = 26.7$

Thus, the ACTUAL required number of measurements is as follows:

 $\Delta \delta = (DCGL_{REMOVABLE} - LBGR_{REMOVABLE}) SD_{REMOVABLE}$

 $\Delta/\delta_{transuranics} = (20 \text{ dpm/}100 \text{cm}^2 - 10 \text{ dpm/}100 \text{cm}^2)/\frac{2.69}{2.69} \text{ dpm/}100 \text{cm}^2 = \frac{3.7}{2.69}$

β:

 $\Delta/\delta = (DCGL_{REMOVABLE} - LBGR_{REMOVABLE})/SD_{REMOVABLE}$

 $\Delta/\delta_{transuranics} = (1000 \text{ dpm/}100\text{cm}^2 - 500 \text{ dpm/}100\text{cm}^2)/26.7 \text{ dpm/}100\text{cm}^2 = 18.7$

Where: Δ/δ

is the relative shift or the resolution of measurements in units of measurement

uncertainty.

DCGL REMOVABLE is the removable surface contamination derived concentration guideline value (DOE Order 5400.5

removable surface contamination limit equals 20 dpm/100cm² for transuranics per the T112A-C Pre

Demolition Survey Plan)

LBGR REMOVABLE is the lower bound of the gray region – the lower bound of the range of values of the parameter of

interest in a survey unit where the consequences of making a decision error is relatively minor (set equal

to value utilized in original sample size calculation).

SD REMOVABLE is the ACTUAL standard deviation of the removable surface contamination measurements

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112 Building: T112A
Survey Unit: D (T112A Exterior)

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of removable surface contamination measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on radioactive contaminants of concern not being present in the background:

$$\alpha$$
N = $(1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$
N = $(1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = 10.9$

$$β$$
N = $(1.645 + 1.645)^2 / 4(Sign P - 0.5)^2$
N = $(1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = 10.9$

Where:

is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$$N = 10.9 * 1.2 = 13$$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of $\underline{13}$ α and β Removable Surface Contamination measurements were required in $\underline{\text{Unit D}}$.

Step 4:

Draw conclusions from the data: All measurements are less than DCGL_w. The minimum number of required removable survey measurements were collected. Thus, survey <u>Unit D</u> complies with the removable contamination release criteria.

Shan	8-19-99
Radiological Engineer Signature	Date
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Radiological Engineer Signature	/ Date
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Survey Area: T112 | Building: T112A

Survey Unit: D (T112A Exterior)

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the <u>Unit D</u> data are calculated on the "<u>Survey Unit D Data</u>" sheet. Because all total surface activity (TSA or TSC) measurement results are less than DCGLw (less than 100 dpm/100 cm²), the survey unit clearly meets the TSA release criterion.

A graphical data review was also performed on the attached form. The posting plot indicated that spatial trends of elevated areas are not present. The histogram indicated that no isolated areas of elevated activity are present.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with α = 0.05 and β = 0.05. The number of sample points calculated (see "Total Surface Activity Measurement Calculation Worksheet") was based on the use of this test. A local area background (LAB) value was subtracted from each gross measurement to calculate a net result, thus the sign test applies (sign test is typically applied only when the contaminant is not present in background).

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGLw. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGLw.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of samples with the ACTUAL survey unit standard deviation.

The actual total surface contamination standard deviations for <u>Unit D</u> are: $\alpha 24.7$ $\beta 153$

Thus, the ACTUAL required number of samples is as follows:

$$\Delta/\delta = (DCGL_{TSA} - LBGR_{TSA})/SD_{TSA}$$

 α $\Delta/\delta_{\text{transuranics}} = (100 \text{ dpm}/100 \text{cm}^2 - 50 \text{ dpm}/100 \text{cm}^2)/\frac{24.7}{24.7} \text{ dpm}/100 \text{cm}^2 = \frac{2.0}{2.0}$

 β $\Delta/\delta_{transuranics} = (5000 \text{ dpm}/100 \text{cm}^2 - 2500 \text{ dpm}/100 \text{cm}^2)/\frac{153}{153} \text{ dpm}/100 \text{cm}^2 = \frac{16.4}{150}$

Where:

 Δ/δ is the relative shift or the resolution of measurements in units of measurement

uncertainty

DCGL TSA is the total surface Activity derived concentration guideline value (DOE Order 5400.5 total surface

Activity limit equals 100 dpm/100cm² for transuranics and 5000 dpm/100cm² for uranium, per the

T112A-C Pre Demolition Survey Plan)

LBGR TSA is the lower bound of the gray region – the lower bound of the range of values of the parameter of

interest in a survey unit where the consequences of making a decision error is relatively minor (set equal

to the value utilized in the original sample size calculation).

SD TSA is the ACTUAL standard deviation of the total surface Activity

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals $\underline{0.998650}$ for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112 Building: T112A
Survey Unit: D (T112A Exterior)

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of TSA surface Activity measurements for the applicable survey unit using the following

MARSSIM, Section 5.5.2.3 formula that is based on Plutonium contaminants not being present in the background:

 α and β

 $N = (1.645 + 1.645)^2 / 4(Sign P - 0.5)^2$

 $N = (1.645 + 1.645)^{2}/4(0.998650-0.5)^{2} = 10.9$

Where:

1.646

is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition

Survey Plan

Sign P

equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

N = 10.9 * 1.2 = 13

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 Total Surface Activity measurements were required in Unit D.

Step 4:

Draw conclusions from the data: All measurements are less than DCGL_w. The minimum number of required TSA measurements were collected. Thus, survey <u>Unit D</u> complies with the TSA release criteria.

D. A. BARNET	Q12	8-19-99
Prepared By: Printed Name	Radiølogical Engineer Signature	Date
Es TASROOKS	A Sestatula	8/11/95
Reviewed By: Printed Name	Radiological Engineer Signature	Date

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1 T112A ROOM 4 WALL A6*	<6.5	<200	, <u>- </u>		21			1			
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4 T112A ROOM 9 FLOOR A3*	<6.5	<200	1		24						
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8 T112A EXTERIOR EAST WALL K3*	<6.5				28						
9 T112A EXTERIOR SOUTH WALL E3*	<6.5	<200			29						
10 TI12A EXTERIOR ROOF A2*	<6.5	<200			30		N/A				
11 T112B ROOM 1 CEILING B3*	<6.5	<200	N	A	31	,					
12 T112B ROOM 2 FLOOR H1*	<6.5	<200		1	32						
13 T112B EXTERIOR SOUTH WALL E2*	<6.5	<200		1	33						
14 T112B EXTERIOR NORTH WALL LI*	<6.5	<200			34						
15 T112B EXTERIOR ROOF F1*	<6.5	<200		\prod	35						
16 TI12C ROOM I FLOOR CI*	<6.5	<200		\prod	36						
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Rev. 05/98

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7	T112A EXTERIOR ROOF E3	<8.3	<200	71	<288	QA	#8			$\vdash \! \perp$	<u> </u>	⊲3	<288
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T112A exterior

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

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6	T112A EXTERIOR EAST WALL M1			67	<288		29 "DEFIGLTIONS";	_			<u> </u>
7	T112A EXTERIOR EAST WALL N1			<33	<288		17 100 DPM/10012	┴			
8	T112A EXTERIOR EAST WALL PI			48	<288		RUNGEM	<u> </u>			
9	T112A EXTERIOR WEST WALL B1*			67	<288					<u> </u>	
10	T112A EXTERIOR WEST WALL C1			48,	<288			<u> </u>	<u> </u>		
11	T112A EXTERIOR WEST WALL D1		,	<33	<288					<u> </u>	
12	T112A EXTERIOR WEST WALL E1			67	<288						<u>L</u>
13	T112A EXTERIOR WEST WALL F1			43	<288				<u> </u>		
14	T112A EXTERIOR WEST WALL G1*			52	<288				<u> </u>		
15	T112A EXTERIOR WEST WALL H1	N	/A _	<33	<288				<u> </u>		<u> </u>
	T112A EXTERIOR WEST WALL II			81	<288		NχA	<u> </u>			<u> </u>
	T112A EXTERIOR WEST WALL J1			67	<288		,				
	T112A EXTERIOR WEST WALL K1		\prod_{-}	52	395					<u> </u>	<u></u>
19	T112A EXTERIOR WEST WALL L1			(286	√288						<u> </u>
20	T112A EXTERIOR WEST WALL MI		$\prod_{i=1}^{n}$	48	<288				<u> </u>	<u> </u>	
21	T112A EXTERIOR WEST WALL N1	Ī .	Π.	<33	688						ļ
22	T112A EXTERIOR WEST WALL O1		\prod	48	<288						
23	T112A EXTERIOR WEST WALL P1		\prod	67	<288						
24	T112A EXTERIOR ROOF A2*			95	389						
25	T112A EXTERIOR ROOF E3		17	76	<288						
26	T112A EXTERIOR ROOF E5			62	<288			7			
27	T112A EXTERIOR ROOF G3			67	<288						
28	T112A EXTERIOR ROOF M8			90	<288			\top			
29	T112A EXTERIOR ROOF N7			81	<288						
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CONTINUATION SHEET

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12			15	412				
13			10	448				
14			12	396				
12			7	440				
15			18	421				
16		-	15	350				
17			12	507				
18			6.1	296				
19			11	412				
20			7	602				
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25			14	465				
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Seria		835					7	i	i	Loca	tion	i:				30 Ya					
1			Cal Due				N	/A		Purp	ose:		Resur	vey p	er R.	E. (M.	ARS	SIM	Sur	(ey)	
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Bkg.			Bkg				_		cpm	RCI	<u>: </u>	<u> </u>	N/A		1						
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1	T112	C ROOF				9.1			\vdash		#1	,	<u>` </u>					\	-	71	<294
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l) —			, , , , , , , , , , , , , , , , , , , 			10.6		_	$\overline{}$		#0								1	02	<294
		A ROOF				<7.5		(53)	<294										\vdash	 	-
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Rev. 05/98

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ALPHA REMOVABLE VALUES FOR 2 MIN COUNTS

8-24-99

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE														
	INSTRUMENT DATA			*		~								
Mfg.			i	i	L	Surv				INATION	LSUI	RVE'	<u> </u>	
Mode		_				Build				T112c				
Seria			/ :		¥	Loca	-			30 Yard				
Cal I			N/	<u>A_</u> ,		Purpo	se: _	MA	RSSIM	I Release S	Surve	<u>y</u>		 .
Bkg.				\- -										
ı	ency 33 % Efficiency 33 % Efficiency			7	1	RWF	'#: _		····	N/A				
MDA	6.5 dpm MDA 6.5 dpm MD	A	·			ъ.				æ.				
						Date	-	08-05-99	<u> </u>	Time:		4:30		
Mfg.			NEt			D.CT	;	3	,				,	
Mode			Elec		- 1	RCT		Hersey		Ciamat				
Seria		al#	182		-			Print name		Signatu	ıre		Em	p. #
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Bkg.						KCI.		Espinoza		C:			F	. "
	ency 25 % Efficiency 25 % Effici							Print name		Signatu	пе		Em	p. #
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	Alpha removable was a two minut	C COM		URV			ULT:	Š						
٠	Location/Description	Remo		То		Swipe		Location/De	ecription		Remo	veble	To	tal
wipd #	(Results in DPM/100CM ²)			Alpha		SWIPC #		(Results in DP)			Alpha		Alpha	
						QA	#2			<u> </u>	\ \	Dott	9	239
	T112C ROOM 1 FLOOR B4	0.0	36	45	257	QA	_	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	\forall		31	-245
1	T112C ROOM 1 FLOOR C2 *	0.0	8	27	281						N	/^	9	-215
	T112C ROOM 1 WALL D1	1.5	-20	9	-6	QA.					111	7		
1	T112C ROOM 1 WALL E2	1.5	-20	22	72	QA		· · · · · · · · · · · · · · · · · · ·				7	9	-9
5	T112C ROOM 2 WALL K2	0.0	-16	. 31	-230	QA	#16			•		\vdash	108	75
6	T112C ROOM 3 WALL E1	0.0	4	18	-137								ļ	
7	T112C ROOM 3 WALL J2 *	1.5	-8	9	-334		\searrow				 		-	
8	T112C ROOM 3 WALL L1	0.0	40	4	149	L	. `			4 114				<u> </u>
9	T112C ROOM 4 WALL E2	0.0	4	31	-361					a. ()	<u> </u>	<u> </u>		
10	T112C ROOM 5 WALL B2	0.0	8	36	-224				2000	, . f	 	ļ	L	
11	T112C ROOM 5 WALL H1 *	1.5	-40	36	-364				1/2 2					<u> </u>
12	T112C ROOM 5 WALL I1	1.5	-24	9	-346			3 (S) (S) W	\geq					
13	T112C ROOM 7 FLOOR C1 *	0.0	-16	13	51				N/A					
14	T112C EXTERIOR NORTH WALL J3	4.5	-24	72	-122		()							
-	T112C EXTERIOR SOUTH WALL G1	1.5	-32	94	-162	13.								
II	T112C EXTERIOR ROOF M3 *	0.0	-40	(130)		2					K			
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COVER SHEET

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7		39	2	286					
8	0	51	1	448 277					
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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE RADIOLOGICAL SAFETY														
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Swipe #	Location/Description Results in DPM/100CM ²	Remo Alpha		Alpha	_	Swipe #	Results in DPM/100CM ²	Remo Alpha		Alpha	tal Beta			
	T112C SOUTH WALL SCAN C1	, upiia	Dota	67	_	ــــــــــــــــــــــــــــــــــــــ	#5 SCAN		- LANE	72	_			
	T112C SOUTH WALL SCAN EI	\		49	352		#12 SCAN	N/A	$\overline{}$	108	346 81			
	T112C SOUTH WALL SCAN GI		-	22	152	VA.	III DOI U	1 77.		108	91			
	T112C SOUTH WALL SCAN II			40	9						 			
	T112C SOUTH WALL SCAN J1 *	1		81	310									
	T112C SOUTH WALL SCAN K1	7	 /A	49	-116									
	T112C SOUTH WALL SCAN L1	1	<u> </u>	18	39	,					 			
	T112C SOUTH WALL SCAN O1	1	ackslash	18	-304	. ;								
	T112C SOUTH WALL SCAN PI		1	67	-227	1		1		·				
	T112C SOUTH WALL SCAN N1	f	1	18	0	 				-				
	T112C SOUTH WALL SCAN M1	 	1	13	-316	-								
	T112C ROOF SCAN M3 *	<u> </u>		99	81	 					l			
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Mfg.	Eberline	Mfg	Eberline	Mfg.	\ <u>'</u>		_	S	urv	ey Ty	уре		ONTA	MINAT	ION	SU	RVE	Y	
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Mod				Model		Electra	_	K	RCT:			ersey		0.4	22) —			
Seria Cal		Serial#	702	Serial#		1827	_	- 1			Print i	name		Sig	natu	re			
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Effic		Bkg Efficiency	4.1. cpm			0 39 2.3 33			CI		Print	pinoza			<u></u>	<u> </u>	ر ر		
MD	, 	•	25 % 200 dpm	. •			۶ <u>د.</u> 5 dp	%			Print	name		Sig	natu	re		-ш	p. #
IVIDA	Zoo dpin	MDA_	200 apm	MDA	. 3	3 20	3 ap	<u>m</u>											
PRI	. #•				. :			!											
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Con	<u> 7411</u>	CSUIG III S	caris were	approx	. cqu	1 10 0	Jacke	grou	iiu c	лсері	проп	13 01 0	ich grio	Hotel of	ı pag	,C Z			
-	Alpha ren	novable w	as a two r	ninute c	ount.		- : -	:	+			 -							
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Swipe	Loca	tion/Descr	iption	R	cmova		Total		wipa			cation/	Descript	ion		Remo	vable	To	otal
. #	1	Its in DPM/10	• .		pha B		ha B	(1	#				PM/100C		l			Alpha	
1	T112C ROOM	1 FLOOR	B4 ·		-	200 4		——	QA	#2					_	\		<33	<285
2	T112C ROOM				_	200 <			QA		1				.	eg		<33	<285
3	T112C ROOM					200 <	_			#11						N	(A	<33	<285
4	T112C ROOM					200 <	_		QA		<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>						7	<33	<285
5	T112C ROOM				_	_		285 (\rightarrow								7	108	<285
6	T112C ROOM				-	200 <		285	$\tilde{\mathbf{x}}$			···						100	
7	T112C ROOM					_		285	_	<u> </u>					_				
8	T112C ROOM				5.5		_	285		$\overline{}$								_	_
9	T112C ROOM						_	285	_		$\overline{}$								
—	T112C ROOM							285				$\overline{}$							
11	T112C ROOM					200 3		285									· -		_
12	T112C ROOM				7.7	_	-	285					$\overline{}$						_
-	T112C ROOM				- 1		_	285			•		N/A						
	T112C ROOM		· · · · ·		_	\neg		285					11/21						
	T112C EXTER						_	285	- :	1 1					$\overline{}$			_	
16	T112C EXTER					200 1	$\overline{}$				·				\rightarrow				_
	THE EXTER	JOK KOO	7 7473		0:0:15	200 1.	30 5	285			- :					7			
1			N/A		+			╬	-								1		\vdash
-	 		IVA	= +	+	-	+							-			 	~	
			·	_	+	+	+								_		-		1
1	·		· · · · · · · · · · · · · · · · · · ·		<u>l _</u>			1				1		- 191	\mathcal{U}	<u></u>	1	L	
Dat	e Reviewed:	9//2	PRINC	Superv	ision		6	P	<u> </u>	0/1		1	Sa		1/2	d			
1	- ALL FIGURES.	april	17 4 133	Super v	.5101	- 4		-Z	rint	Name	exce.	12	W.	Signatu	re	W_			
		<u> </u>				<u> </u>			,		-							_	

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE RADIOLOGICAL SAFETY Continuation Sheet SURVEY RESULTS Removable Swipe Location/Description Total Location/Description Removable Total Swipe Results in DPM/100CM² Results in DPM/100CM² # Alpha Beta Alpha Beta # Alpha Beta Alpha Beta T112C SOUTH WALL SCAN C1 OA #5 SCAN 1 67 1218 72 346 QA #12 SCAN N/A T112C SOUTH WALL SCAN E1 352 49 108 <285 T112C SOUTH WALL SCAN G1 <33 **<285** T112C SOUTH WALL SCAN II <285 40 5 T112C SOUTH WALL SCAN J1 * 81 310 T112C SOUTH WALL SCAN K1 49 **<2**85 T112C SOUTH WALL SCAN L1 <33 |<285 8 T112C SOUTH WALL SCAN O1 <33 <285 T112C SOUTH WALL SCAN P1 67 <285 10 T112C SOUTH WALL SCAN NI <33 | <285 11 T112C SOUTH WALL SCAN MI <33 **<285** 12 T112C ROOF SCAN M3 * 99 <285 N/A ate Reviewed: 4/13/11 RS Supervision: 5 Englished Signature

				Electr	a Performance	Test Lo	g)				
	Instrument S	erial Number		Instrum	ent Efficiency	Alpha	22.2%		Beta	30.1%				
	168	2		Inst	rument Calib	ration Du	ne Date 2-4-	00						
Source Serial Nu	mber	Calibration Due Da	ite	Source A	ct. (dpm)		Source Acct. (cpm)	Source Acceptable Range (sq)					
68014	tlac	WLA			4830		5512	<u> </u>	4410	10 6615				
6039		NA			22723		6840		5472	to to 8208 to				
			· ·							to to				
Date			ALPHA Pass/Fail	BETA Bkgd 3	BETA Reading (Corrected cpm)3	BETA Pass/Fail	RCT Employee Number	RCT NA (Print)	ME	RCT Signature				
815 129	0	4950	Pass	486	6555	Pass		Muri	202	mege				
81 10199	1	.5010	PASS	526	6008	PARA		6. Horsey	King	Desalega				
814199	2	5/10	DASS	481	6392	Pagg		6. Haser		Staguling				
8/12/99	2	5170	PAGE	502	7173	PASS		9 HOSE	NEAMP	Allegora tetry				
8113199	2	4950	PASS	507	6987	PASS		G 439561	. //	Sternethers				
8116199	2	4940	Pass	437	6484	Pass		Mu	WZ	m				
					K	· ·								
//					A A	*								
1 1		<u> </u>		./	A T)								
	·-···		<u> </u>		Mon									
1 1					1 6									
1 1														
1 Source activi	ty in com is equa	I to the source activity	in dom mu	Itiplied by 1	he efficiency.	REV	TEWED BY:	LNCOO	per					

2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to bel minute in duration.

NOT If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta ly, then the alpha portion should be lined through.



Province of the second	ROCK	Y TLÂTS ENV	AIRONINI.	DNTATE, TI	EGELNOJVO)	CY, STUUD	Market Programme Commercial Comme
	INSRUME	The state of the s	THE REAL PROPERTY OF THE PROPE	de se a succession de la seconda de la s			
SAIC	Mfg	/ Mfg		Survey Typ	e: <u>Alpha S</u>	pectroscopy	
Model AP-2	Model	Model		Building:	T112A		
Serial# A146	Serial#	Serial#	<u>· </u>	Location:	Metal Roof		
Cal Due Oct-99	Cal Due	Cal Due		Purpose: RS	P/RF RCM Co	mpliance	
Bkg. N/A	Bkg	Bkg			,		
Efficiency N/A	Efficiency	Efficiency _	1	RWP #:	N/B		
MDA <u>N/A</u>	MDA	$M \longrightarrow MDA$	¥/				_
		\mathcal{U}	Χ /	Date:	07/20/99	Time: _	Day
Mfg.	Mfg.	Mfg	 	D.CT.	D. E. Dand	$\sim \Omega \Omega$	
Model	Model	Model	 	RCT:	R. E. Read Print name	Signorus	
Serial#	Serial#Cal Due	Serial#Cal Due /	 	, r	Tint name	`Signatur	e
Cal Due		Bkg.		RCT:	A 1/1A	/ N/A	1 / .
Efficiency /	Bkg	Efficiency		i	N/A Print name	Signatur	/ \/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\
MDA /	MDA _	MDA /-		1	Thit hame	Olghatui	C Emp. #
					···	· · · · · · · · · · · · · · · · · · ·	
PRL #:							
Comments: Both	Count Time	s were 60 mins. In t	ooth cases de	etector colum	nator was appro	x. 1/16th to 1/8th	in.
abvo	ve sample su	rface, which might	skew spectn	ım to the left.			
			SURVEY	<u>RESULTS</u>			
1	•	·	990720.SPE	ME	V> 2 3	4 5 6	7 8 9 10
	•		990720.SPE REC# 3 OF	3	4.5	·* /49	
			MIN:	17 .		3.9	·
			RANGE:	17		1	
			SCALE: MIN to Cursor MEV:	2.3			
			COUNT:	7	·	1, 111,	
			Pu239 Cts: 9 Radon Ctc:		}	5.3	
			Gross Cts: 2		2.3	3.3	
					.,		
990720.SPE	MEV>	2 3 4 5 2.3 5.0	AP-2 SN# A	146	_		
REC# 2 OF 3		2.3 / 5.0	Item Descrip	otion: Metal			
MIN: 0 MAX: 8	1		roof on T11				8.4
RANGE: 8 SCALE:MIN to MAX			Location# 2			6.2	
Cursor MEV: 4.5					T ÜLARIORATUURUIĞI		
COUNT: 8 Pu239 Cts: 32	}	3.5					
Radon Cts: 11		3.3	5.1 /				
Gross Cts: 121	}		•	8.4		•	-
AP-2 SN# A146	}				٠.		
Ar -2 514# A140			1	•			
Item Description:	Metal		5.8		•		•=-
roof on T112A			3.8 	1	ļ		
Salony I						_	•
	<i>a</i>			i ^	ı , 🖌		
e Reviewed:	7-21-99	RS Supervision	: <u>LNC</u>	ooper Driet Nama	- I Mu	Signatura	
				Prifit Name	7 ^	Signature	
	7-21-99		D.A.	BAIRNES	(() 0	12-	

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Best Available Copy

ROCKÝ FLATS ENVIRONMENTAL TECHNOLOGY SITE

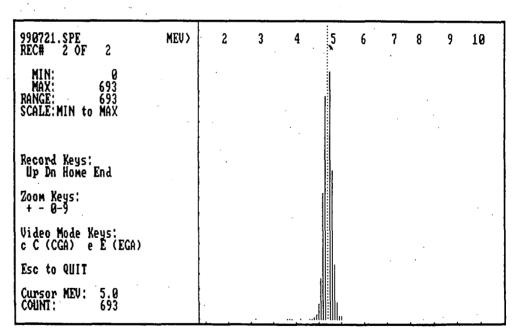
RADIOLOGICAL SAFETY

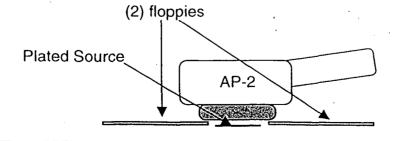
Drawing Showing Survey Points

This spectrum was taken with probe directly on the surface of the plated source.

990721.SPE REC# 1 OF 2	MEU>	2	3	4	5	6	7	8	9	10
MIN: 0 MAX: 783 RANGE: 783 SCALE:MIN to MAX							•			
Record Keys: Up Dn Home End Zoom Keys: + - 0-9										
Video Mode Keys: c C (CGA) e E (EGA)	-									
Esc to QUIT Cursor MEV: 5.2 COUNT: 783										

This spectrum was taken with probe approx. 1/8th in above surface of the same source.





22		K	ICKY F	LAT.	YE	NV	KO)	NAM	n N/I	AL I	rechinolio(WAYUE				
		INSRU	MENT D	ATA												
wig.	EBERLINE	Mfg. EB	ERLINE	Mfg.		N	E .			vey T		AMINATION	· · · · · · · · · · · · · · · · · · ·		-	
Mode	lel SAC-4		SAC-4	Mode	el		EC	ΓRA		ding:_						
Seria		Serial#	842	Seria			65		•	ttion:	Ro					
Cal I	Due <u>12/7/99</u>	Cal Due_		Cal I	Due _				Purp	ose:	Pre-Job	Survey				
Bkg.	0	Bkg	0	Bkg. 1/556						1. /4						
Effici		Efficiency	0.33	Efficie	-				RWI	P#: _		N/A				
MDA	A <u><20</u>	MDA	<u><20</u>	MDA	<i>'</i>	33 /	361		1				, -	7 (7)		÷
	EDEDI ME	MG ED	EDI INE) (C-					Date): -	07/20/99	- Time:	13 blhvi	-		
Mod	. <u>EBERLINE</u> lel BC-4		BC-4	Mode					RCT	•••	S. Jablkowski	1/1 Spil	hehit	Sir		
Seria		Serial#	702	Seria					INCI	·	Print name	// Signa				
Ц	Due 9/25/99		11/20/99				•		l		T TIME HUMO	/ (J.g.n.	·····			ф. #
Bkg.		Bkg.	40	Bkg.					RCT	•		, , ,		1		
Effici		-	0.25	Efficien						<u> </u>	Print name	Signa	ture		Em	p. #
MD/	-	MDA	<200	MDA	-			,			•					
									٠							
PRL	<i>,</i> #:		·									•	•			
Ħ	aments:	Pre-Job s	urvey on ro	of for	drill	ling s	ampl	e.								
			<u> </u>			E MA				TO	TAL ALPA	4A READIN	145	are	<u>-</u>	
							<u>, </u>				UE MINUT					
							SUR	VEY I	RESU	JLTS		Мар				
wipa	Lo	cation/Descri	iption		Remo	ovable	Т	otal	Swipe		Location/Desc	ription	Remov	able	To	otal
_ ``	ł	ults in DPM/10	-	[.	Alpha	Beta	Alpha	Beta	#		Results in DPM/1	100sq cm	Alpha	Bcta A	Upha	Beta
		See Map			<20	2 00	186	⊲61								
		1			<20	<200	144	⊲61								
3													1 1	1		
4	·												1 1			
5	ł															
6							_									
6							_									
7							_									
7 8						/	_					No.				
7 8 9				.9		/	_									
7 8 9 10			,	(9												
7 8 9 10 11			7.30	,(g			_									
7 8 9 10 11 12		Q	1.30	<u>19</u>												
7 8 9 10 11 12 13		4		<u>(9</u>												
7 8 9 10 11 12 13		•	1.30	, G												
7 8 9 10 11 12 13 14 15		1	1.30	<u>, (9</u>												
7 8 9 10 11 12 13 14 15 16		\$	1.30	(9)												
7 8 9 10 11 12 13 14 15			1.30	(G												
7 8 9 10 11 12 13 14 15 16			7.30	,G												
7 8 9 10 11 12 13 14 15 16			7.30	49												
7 8 9 10 11 12 13 14 15 16 17 18			1.30	(9)												
7 8 9 10 11 12 13 14 15 16 17 18 19 20				(G												
7 8 9 10 11 12 13 14 15 16 17 18 19 20	e Reviewed:			Super	visio	on:			Coc			Moore				

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RS FORMS 07.02-01 Page ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE **INSRUMENT DATA** Survey Type: NE CONTAMINATION Mfg. EBERLINE Mfg. EBERLINE Mfg. SAC-4 Model **ELECTRA** Building: T-112 A Model SAC-4 Model 842 Serial# Location: Roof Serial# 861 Serial# 1425 Cal Due 12/7/99 Cal Due 12/9/99 8/25/99 Purpose: Cal Due Post-Job Survey 0.3 Bkg. 0 Bkg. 2 / 548 .21/.316 RWP#: 0.33 0.33 Efficiency Efficiency Efficiency MDA MDA **MDA** <20 44 / 366 1500 07/21/99 Date: Mfg. EBERLINE Mfg. EBERLINE Mfg. RCT: S. Jablkowski Model BC-4 Model BC-4 Model Print name Serial# 704 Serial# 702 Serial# Cal Due 9/25/99 Cal Due 11/20/99 Cal Due Bkg. 36 Bkg. 43 Bkg. RCT: Signature Emp. # Efficiency 0.25 Efficiency 0.25 Efficiency **MDA** <200 MDA <200 **MDA** PRL #: Post-Job survey on roof for sampling. Comments: (SEE MAP) SURVEY RESULTS Map Total Location/Description Removable Total Location/Description Removable Alpha Alpha Beta Alpha Beta Alpha Beta Beta Results in DPM/100sq cm Results in DPM/100sq cm **⊘**0 <200 102 <366 See Map <20 24 <366 <200 3 <20 <200 12 <366 **⊘**20 **200** 114 <366 6 8 9 10 11 12 13 15

te Reviewed: 1/21/19 RS Supervision: 5 English

Signature

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ROCKYTLATSENVIRON	MENTALTE CHINGLOGY SUTE
INSRUMENT DATA	
SAIC Mfg. Mfg.	Survey Type: Alpha Spectroscopy
Model Model Model	Building: T112A
Serial# A146 Serial# Serial#	Location: Metal Roof
Cal Due Oct-99 Cal Due Cal Due	Purpose: RSP/RF RCM Compliance
Bkg. N/A Bkg. Bkg.	
Efficiency N/A Efficiency Efficiency	RWP #: N/D-
MDA N/A MDA MDA	
V V	Date: 07/20/99 Time: Day
Mfg Mfg Mfg	$\sim 10^{-10}$
Model Model Model	RCT: R. E. Read /
Serial# Serial# Serial#	Print name Signature Sing.
Cal Due Cal Due	5 J.mp. n
Bkg. Bkg. Bkg.	RCT: N/A / N/A / N/A
Efficiency Efficiency	Print name Signature Emp. #
MDA / MDA / MDA /	•
DDT 4.	
PRL#:	
Comments: Both Count Times were 60 mins. In both cases of	letector columnator was approx. 1/16th to 1/8th in.
abvove sample surface, which might skew spect	rum to the left.
CHDVIEV	(DECUIT MG
SURVEY	RESULTS
990720.SPE REC# 3 OF	MEU) 2 3 4 5 6 7 8 9 10
RECH 3 OF	3 MEU) 2 3 4 5 6 7 8 9 10 4.5 4.9
MIN: MAX:	3.9
RANGE: SCALE:MIN t.	17 MAY
Cursor MEV:	2.3
COUNT:	0.7
Pu239 Cts: Radon Ctc:	
Gross Cts:	
990720.SPE MEV) 2 3 4 5 AP-2 SN# 2 8 5 O	A146
1 45 Team Danaut	ption: Metal
MAX: 8 roof on T11	2A. 8.4
RANGE: 8 SCALE: MIN to MAX Location#	2 6.2
Cursor MEV: 4.5	
COUNT: 8 Pu239 Cts: 32	
Pu239 Cts: 32 Radon Cts: 11 3.5 5.1	
Gross Cts: 121	8.4
AR 2 SNI# ALAC	
AP-2 SN# A146	· ·
Item Description: Metal	
roof on T112A 5.8	
Location# 1	
	. 1.
eviewed: 7-21-99 RS Supervision: (NC	Print Name Signature
The state of the s	

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Page 1 of 2

			R	OCKY F.	LAT	SE	NV	RO	NME	NT.	AL TE(HNOLOGYS	ITE-				
.			INSR	UMENT D	ATA										······		22220000000000000000000000000000000000
Mfg.	EBE	ERLINE	Mfg. E	BERLINE	Mfg.		N	Œ_		Surv	ey Type:	CONTAMIN	MOTTA				
Mode	el	SAC-4	_	SAC-4	Mod	el	EI	EC	TRA	Buile	ling:	T-112 A & B					
Seria		861	Serial#_		Seria	_		<u>25</u>		•	tion:	· · · · · · · · · · · · · · · · · · ·					
	-	12/7/99	Cal Due	12/9/99		-	8/25	5/99		Ршр	ose:	Unrestricted R	lelease				
Bkg.		0.3	Bkg	0	Bkg.		2/	<u>548</u>					/				
Effici	•	0.33	Efficiency		Efficie	-	.21/	.316		RWI)#:	~/	4				
MDA	۸	<20_	MDA _	<20	MDA	۱	44 /	366						1//			
N 66~	rpr	שאו זמי	Mfa E	BERLINE	\					Date	:	07/21/99	Fime:	74	45		
Mode		BC-4	Model	BC-4	Mode					RCT		Jablkowski //	Last	wws.	L.	/	ŀ
Seria		704	Serial#	702	Seria				•	I'C'		int name	Signati	ıre		4	10 ff 1
		9/25/99	_	11/20/99		_										Lu	ıp. #
Bkg.	-	36	Bkg.	43	Bkg.	_				RCT		. /	V			/	
Effici			Efficiency		Efficie							nt name	Signati	пе	· · · · · ·	En	ıp. #
MDA	•	<200	MDA	<200	MDA									_ •			-p
PRL Com	_		(8) Sam	pling bottles			E MA	(P)		•		002.002, 003.001,	003.002,	004.	001,	004.	.002
			<u>-</u>					<u>SUR</u>	VEY I	RESU	LTS	Map					
ત્ત્વ		Lo	cation/Des	cription	,		vable	_		Swipe		Location/Description		Remo			otal
		Restu	Its in DPM/	100sq cm		Alpha	Beta	Alpha	Beta	#		Results in DPM/100sq cm		Alpha	Beta	Alpha	Beta
			S∞ Mar)		<20	<200	<44	<366	 	· · · · · · · · · · · · · · · · · · ·						
2						<20	<200	<44	<366								
3						<20	<200	<44	<366								
4						⊘ 20	<200	<44	⊲366				<i>P</i>		_/		
5						<20	<200	<44	⊲66		<u> </u>						
6						⊘ 0	<200	<44	<366					\angle			
7	·	wa				<20	<200	<44	<366				4/				
8			1	374		2 0	<200	<44	⊲66				47				
9									\angle				W/				
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14				1/1/													
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17				7													
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20	<i>Z</i>																
) :	Rev	iewed:	7-21	/- <i>99</i> _rss	Super	visio)n:		Λ (P	OC Print	211 lame	1 M	OO GE	W)			

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Survey Area: T112	Survey Unit:	Unit D	Building: T112A
Survey Unit Description	n: Office trailer	– Pre Dem	olition Survey

SURVEY PACKAGE COVER SHEET

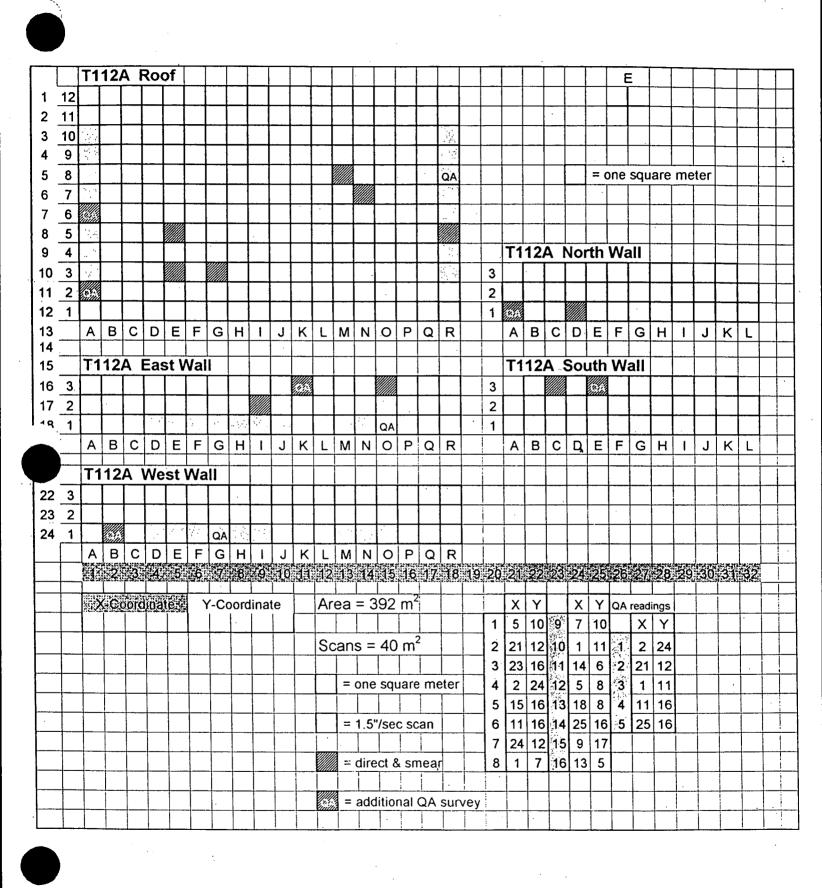
Building Information		
Classification: Type 1 X Type 2 Type	pe 3 🔲	
Contaminants of Concern: Plutonium	Uranium 🗵 Other 🛘	_ _
Special Support Requiremen	nts	
Survey points randomly generated by Rad	iological Engineering	
Special Safety Precautions		
Per 3-PRO-165-RSP-07.02, "Contamination	on Monitoring Requirements" and IWCP	
Labeling Requirements	·	
Not Applicable		
Survey Package Implementa	ition	
This survey package is ready for implement	ntation.	•
D. A. BARNES	DAZ:	8-3-99
Radiological Engineer Printed Name	Radiological Engineer Signature	Date
1 1 1 1 1 1 1 1 1 1	ALL TO	-1-100
H-13.15 8 TANBROUKS RE Peer Review Printed Name	RE Peer Review Signature	8/3/99
	RE Feel Review Signature	/ Date
Survey Package Closure	·	
All required reviews are complete, and dat authorized for closure.	a analysis results meet RLCP criteria. Survey pa	ickage is
	612	N 10 00
D. A. Basses Radiological Engineer Printed Name	Radiological Engineer Signature	17-19-99 Date
	Naulylogical Engineer Signature	- Late
Es 1743,2001ES	M. Belahalp	8/19/97
RE Manager Printed Name	RE Manager Signature	Date

Survey Area: T112 Survey Unit: Unit C Building: T1
Survey Unit Description: Office trailer – Pre Demolition Survey Building: T112C

SAMPLING AND SURVEY INSTRUCTIONS

Measurement	Amount & Type	Comments
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed.
· .	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m ² scan surveys will be performed at locations indicated.
		Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None

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3	10					1	_		一			\dashv			一		一		寸	_	\neg													П	_
A	9			一十	\neg				\dashv			_		一	_	\neg		寸	\dashv		\dashv			1	一										_
_	8	\vdash		\dashv		┪				\dashv	-				\dashv		一	\neg	QA		\neg	\dashv		T		= 0	ne	squ	are	me	ter				=
5	$\frac{6}{7}$	\vdash			一	-				_		\dashv	一				-		-	$\neg \uparrow$	1		\dashv												
6		QA							\dashv	-	-			\dashv		\dashv	\neg			-	\dashv		十												
7	6	UA															\dashv					\dashv		ale	8-10	-99								\Box	
8	5		\vdash	\dashv							_			\dashv					\dashv		\dashv	T1	12/	3 V	Ver	SF I	Na	11	Vos	1h				\Box	
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September 23, 1997

Post-It Fax Note 7671	Date 7 26 pages 2
To Dave Barnes	From Barrasso
Co./Dept.	Ca.
Phone #	Phone # 8451
Fax # 8048	Fax # 8027

Alan Parker Vice President Closure Projects Int. Kaiser-Hill, L. L. C.

RADIOLOGICAL REQUIREMENTS FOR RELEASE OF THE 690 AND 891 TRAILER CLUSTERS - DJH-028-97

At your request, Radiological Engineering is documenting the series of events that have taken place with the radiological surveys and laboratory analysis performed on the 690 Trailer cluster as well as the 891 trailers. Based on the following information, Radiological Engineering will proceed with Property/Waste Release Evaluations (P/WRE) for the unrestricted release of the 690 Trailer cluster and the 891 Trailer cluster. (The 690 trailer cluster is composed of trailers T690 A, B, C, D, E, F, G, H, I, J, K, L, M, T371G and T444A, and the 891 trailer cluster includes trailers T891 A, L, M, N and T900E.)

Starting in early summer, Radiological Engineering approved survey plans to survey the interior of the 690 Trailer Cluster and the 891 trailer cluster. The survey frequency was based on guidance from NUREG 5849, "Manual for Conducting Radiological Surveys in Support of License Termination" and the guidance in MARSSIM, "Multi-Agency Radiation Survey and Site Investigation Manual." Based on process history, surveys were only required on the Trailer interiors and on certain exterior equipment including the T690K exhaust ducting.

In August, 1997, an RCT performed surveys on the T690K exhaust ducting and found no fixed or removable contamination above the release limits. After the RCT performed the duct survey, he placed his survey instrument on an exterior rusted metal support and noticed elevated alpha activity. This led to additional exterior surveys which also detected elevated alpha activity averaging around 200 dpm/100cm² fixed with no removable which would be above the unrestricted release criteria assuming the alpha activity was from transuranics (e.g. plutonium).

At this point Radiological Safety characterized this elevated area with a hand held alpha analyzer (SAIC Model AP-2) to determine the Isotope. The spectrum revealed a predominant peak in the 5 MeV energy range which is indicative of plutonium. Additional characterization surveys of the 690 trailers with the AP-2 also Indicated plutonium. This led to additional surveys of both the 690 and 891 trailers which all had elevated alpha activity with the roofs and rusted horizontal areas having the most activity. Radiological Safety then launched an extensive effort to bound the size of the elevated alpha activity measurements across the site. Elevated readings were measured on the roofs of the 891 trailers. Days later, surveys on a cargo container near T130B revealed elevated alpha activity in the 200 dpm/100cm² range.

Given the wide spread nature of this phenomena, and the fact that it just didn't make sense that the origin of this elevated activity could be from Rocky Flats activities, metal roof samples were taken from the 690 trailers and sent to the B559 labs and B881 labs on-site and to an offsite lab in Charleston, South Carolina. Attached are the results from these laboratories. The final conclusions from all of the labs is that the

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radioactivity on the roofing material was from naturally occurring radiolsotopes. The attached laboratory results document this conclusion. The energy level of some of the naturally occurring isotopes is very close to that for plutonium-239 (239Pu); for example Polonium-210 (210Po) has an alpha energy of 5.3 MeV and the alpha energy for ²³⁹Pu is 5.1 MeV. With the AP-2 it is evidently very difficult to discriminate between ²³⁹Pu and ²¹⁰Po. The laboratory analysis process, in contrast to the AP-2 field acquisition, is performed in a controlled laboratory environment, has a much higher degree of resolution and therefore allows the lab to make this discrimination.

Based on the laboratory data, the isotopes are not uranium, plutonium or americium. The laboratory results indicate that the source of this activity is from isotopes found in naturally occurring decay chains. Many of the isotopes are short lived, and the total activity is below release criteria. Therefore, Radiological Engineering will proceed with the issuance of the PWREs which will provide the final authorization to release the trailers. The interior of the 690 and 891 trailers, however, are still required to be surveyed in accordance with the original decommissioning survey plans. This laboratory data also supports the original Radiological Engineering determination that the 690 trailer exteriors could be free released without radiological surveys based on process history. This same process history applies to the 891 trailer exteriors which, based on their age, location and usage, can be free released without exterior surveys. It should also be noted that not all trailers and buildings fall into the category of "no surveys required" for the exterior. Each trailer/building is evaluated on a case by case basis.

Based on all of these recent findings, Radiological Engineering developed a corrective action plan for future AP-2 usage. Radiological Engineering suspended the use of the AP-2 on 9/18/97 and briefed the Radiological Engineering department on the recent AP-2 findings as the first step of this corrective action plan. This action is necessary to prevent further field misinterpretation of AP-2 readings. The action plan also requires a revision to the AP-2 procedure and requires review of the Job Performance Measures (JPM) in the AP-2 training backage for evaluating and approving AP-2 results. The AP-2 will not be reauthorized for use until the conditions in the action plan are met. In addition, Radiological Engineering will continue to investigate the mechanism that is causing this elevated activity to deposit on the trailers.

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Please contact Jeff Barroso at Extension 8451 If you have any additional questions.

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Attachment: As Stated

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DUE DATE **ACTION**

APR 23 1998

AME:TAD:PPP:02637

Application of Surface Contamination Guidelines from DOE Order 5400.5

Wynn A. Harding, Vice President Safety Systems and Engineering Kaiser-Hill Company, L.L.C.

Reference: Ltr, Harding to Lowe, 98-RF-00974, subject: same, dtd 3/10/98

The Kaiser-Hill Company, L.L.C. (Kaiser-Hill) requested approval of the interpretations for surface contamination as set forth in the reference above. The Rocky Flats Field Office concurs with your interpretation because the conservative nature of the proposed approach is consistent with the guidelines specified in the Final Multi-Agency Radiation Survey and Site Investigation Manual.

David C. Lowe

Assistant Manager for Engineering

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cc:

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Reviewed for Addressee Corres. Control RFP

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IN REPLY TO RFP CC NO .:

PARTIAL/OPEN

RF-46469 (Rev. 2/28/97)

CLOSED

ACTION ITEM STATUS:

LTR APPROVALS:

ORIG. & TYPIST INITIALS:

N/A

KAISER · HILL

March 10, 1998

98-RF-009

David C. Lowe Assistant Manager for Engineering DOE, RFFO

APPLICATION OF SURFACE CONTAMINATION GUIDELINES FROM DEPARTMENT OF ENERGY ORDER 5400.5 - WAH-064-98

Kaiser-Hill requests that DOE, RFFO approve Kaiser-Hill's interpretation of Department of Energy (DOE) Order 5400.5, Figure IV-1, "Surface Contamination Guidelines." This interpretation concerns how a surface can be evaluated with respect to the "Allowable Total Residual Surface Contamination" (ATRSC) in Figure IV-1.

Historically, compliance with the ATRSC limits has been met at the Rocky Flats Environment Technology Site (RFETS) by surveying items or areas with direct reading radiation detection equipment. This radiation detection equipment can only detect radioactive material located directly on a surface. Therefore, it currently needs to be assured that all radioactive material present on the surface of the item, or area being surveyed to show compliance with the ATRS limits. In some instances radioactive material may have penetrated into the surface of a material to a limited degree (e.g., a spill of radioactive material in liquid form on a concrete floor), or radioactive material may be present in a material on a surface (e.g., radioactive material present in a coating of paint). In these cases, the current methods for assuring compliance with the ATRSC limits in DOE Order 5400.5 are not sufficient. Alternative method need to be developed to assure compliance.

Kaiser-Hill believes that the ATRSC limits may be applied to materials that contain radioactive material if this radioactive material is evaluated with a conservative approach that is appropria to the situation. The following outlines this approach:

- 1. For a given surface type (i.e., concrete surface, paint sample, etc.), a sample will be taken of the surface to the depth of the radioactive material present (i.e., to a 1 cm depth of the concrete, to the depth of the paint, etc.)
- 2. The sample will be taken from a defined area of the surface (i.e., from a 10 cm X 10 cm area, from a 10 inch X 10 inch area, etc.)
- 3. The sample will be analyzed for radioactive material indicative of RFETS (i.e., plutonium, americium, uranium, etc.)

Kaiser-Hill Company, L.L.C.

Courier Address: Rocky Flats Environmental Technology Site, State Hwy. 93 and Cactus, Rocky Flats, CO 80007 + 303.966.7000

Mailing Address: P.O. Box 464, Golden, Colorado 80402-0464

David C. Lowe March 10, 1998 98-RF-00974 Page 2

- 4. The amount of radioactive material in the sample is then uniformly distributed over the sample area so that the amount of radioactive material present in the sample is in the units of dpm/100cm²
- 5. This quantity is then compared with the ATRSC limits.

This approach is conservative and appropriate in that all the radioactive material contained in the surface is concentrated at the top of the surface and then compared with the ATRSC limits. Therefore, the "Total" amount of radioactive material present is being compared with the ATRSC limits. Also, this is conservative and appropriate since it is much harder for the radioactive material contained in a surface to come into contact with an individual than if the radioactive material is present on the surface. This approach is also consistent with the approach in Section 7.5.2.2, "Sample Content," of the Final MARSSIM (Multi-Agency Radiation Survey and Site Investigation Manual).

Kaiser-Hill believes that the above approach should be used when evaluating radioactive material that is contained in a surface. Kaiser-Hill requests that DOE, RFFO approve Kaiser-Hill's approach to complying with DOE Order 5400.5, Figure IV-1 by March 30, 1998 to support the Building 123 & 779 Deactivation and Decommissioning projects.

If you have any questions or comments, please contact Rick Roberts at Extension 4869 or Jeff Barroso at Extension 8451.

Wynn A. Harding

Vice-President \

Safety Systems & Engineering Kaiser-Hill Company, L.L.C.

RSR:cjb

Orig. and 1 cc - David C. Lowe

CASE NARRATIVE RIN 99A8967 Laboratory Report Identification Number: 1643 PSA Module RC01B3

August 9, 1999

Ø 005

I. Introduction

On April 27, 1999, four waste samples, (RIN 99A8967), were received for analysis at the Sanford Cohen and Associates (SC&A) Southeastern Environmental Laboratory, located in Montgomery, Alabama. The chain-of-custody accompanying the samples requested they be analyzed on a "rush" basis. The samples were analyzed in accordance with Kaiser-Hill specifications stated in the "Statement of Work for Analytical Measurements, Isotopic Determinations by Alpha Spectrometry, Module RCO1-B.3", dated April 24, 1998, and Modification 09, dated July 16, 1998.

II. Analytical Methodology

The radioanalytical results reported for each sample include the site and laboratory sample identification numbers, collection date, method of analysis, and the quality control samples that were analyzed concurrently. All samples were analyzed by an Eichrom Industries, Inc. extraction chromatography method (ACW03) for isotopic uranium, plutonium, and americium.

III. Analytical Results

Deficiencies

See Reanalysis.

Matrix Interferences

There were no indications of matrix interference,

Dilutions

No dilutions were required.

Detection Limits

The required detection limits (RDL) were met for all sample analyses.

PRELIMINARY INFORMATION

Reanalysis

The Am-243 tracer recovery in samples KH199-1643-03, KH199-1643-04 was less than the 20% specified in the SOW. The samples were reanalyzed beginning with sample preparation and the results were acceptable. The Original and Reanalysis Sample I.D. are listed below.

Original Laboratory Sample I.D.	Reanalysis Laboratory Sample LD.	Analysia Type
KH199-1643-03	KH199-1643-03B	Am-241
KH199-1643-04	KH199-1643-03B	Am-241

Deviations from Protocols

There were no deviations from the written protocols and analytical methods.

Contacts with the CTR

There were no contacts with the contract technical representative (CTR) regarding these samples.

IV. Quality Control

Site Samples Used for Quality Control Samples:

Site Sample Number	Laboratory Sample Number	Type of Quality Control Analysis Sample
Laboratory Type II Water	SCAQC-1643-LC1	Laboratory Control Sample
99A8967-001.002 T112 A Conter	SCAQC-1643-LD1	Laboratory Duplicate Sample
Laboratory Type II Water	SCAQC-1643-P8	Preparation Blank

The analytical results of all quality control samples met the acceptance criteria specified in the SOW.

Sincerely,

The commerce

Joe Stinson Laboratory Manager 8|G|Q9

PRELIMINARY INFORMATION

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Radioanalytical Results

Report Identification Number: 99A8967

Project Name: Kalagn-Hill	Chairi-of-Custody Number: 96A6967#002	Market Mark
Site Sample ID: 001,002		Mainbo Waste
Other Sample ID: T112 A CENTER	Collection Date: 7/21/99	Date Received: 7/27/99
	Batch Number: 1643	Laboratory Code: SCA

,		Laboratory	Activity	2 or Counting Error	Total Error	MDA
Method Number	Radionuolida	Sample ID	(pC1/o)	(pCl/d)	(pCifa)	_(pC/p)_
ACW03	U-233/234	KH199-1843-01	0.264	0.118	0.129	0.034
ACW03	U-255	KH199-1643-01	0.016	0.031	0.031	0.042
ACW03	U-238	KH199-1543-01	0.270	0.120	0,132	0.060
ACW03	PU-238/240	KH199-1843-01	0.000	0.000	0.000	0.045
ACWOS	AM-241	KH199-1843-01	0.000	0.000	0.000	0.086



	Quality Control Samples			
Radionuctide	Laboratory Control Symple (LC)		Propagation Blank (PB)	
U	8CAQC-1643-LC1	\$CAQC-1843-LD1	8CAQC-1643-PB	
Pu	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB	
Am	8CAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB	
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Radioanalytical Results

Report Identification Number: 99A8967

Project Name: Keiser-Hill	Chairmon Charles Number 1997	
589 Sample ID: 002 002	Chain-of-Custody Number: 99A8967 2002	Matric Waste
Other Sample ID: 1112A 5W CORNER	Collection Date: 7/21/99	Date Received: 7/27/99
	Batch Number: 1843	Laboratory Code: SCA

Mathed Number ACW03 ACW03 ACW03	Radionuofida U-233/234 U-235 U-238	Laboratory Samula IO Ki1199-1643-02 Ki1199-1643-02 Ki1199-1643-02	Activity (pCi/ty) 0.259 0.000 0.332	2 of Counting Error (pC(g) 0.121 0.000 0.134	Total Error (oGVo) 0.131 0.000	MDA (oCi/o) 0.072 0.043
ACW03	PU-239/240 AM-241	KH199-1643-02	0.017	0.034	0.149 0.034	0.035 0.045
	nm241	KH189-1643-02	0.000	0.000	0.000	0.053

	•	Quality Control Samples	
U	SCACC-1643-LC1	SCAQC-1643-LD1	Proporation Blank (PB) SCAQC-1643-PB
Pu	80AQC-1643-LC1	SCAQC-1649-LD1	SCAQC-1843-PB
Am	8CAQC-1843-LC1	SCAQC-1643-LD1	SCAQC-1643-PB

PRELIMINARY

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ROCKY FLATSENVIRONMENTAL TECHNOLOGY SITE

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Approved by

LN Cooper

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8-17-99 Date

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NOTE If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta then the alpha portion should be lined through.

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~~~ROCKY FEATSENVIRONMENTAL TEGHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOC BETAIL ALPHA [] INSTURMENT MODEL: (Circle One) Calibration Due Date: 1-7-00 SAC-4 BC-4 DUDLUM 2929 Counter Serial No. Rt 770 Siart Date: 8-16-99 Building :___ 549 End Date: 8-22-79 Location: Source: SM 60392-7 D. P. M .: Certification Duc Date: 114 11142 &Crott Zoaccc char: Crass Source com? Shill PA ate com: Bly. cpe: ACT EMPLY RCT Emp. Not Source open: Net Source com: 1/Error X Emor (Priat Name / Steatiard) "(Prior Kame / Signature) Cross Source open ZM DIAZ Cris Source com: 5117 3 B Time Bty.qua: Ties 8 لزر, دوه: <u>0 000 0</u> Mrugzin M 567 RCT Emp. 4_ Yet Source com: Net Source eren: -10. (Prior Name / Signature) · (Prior Name / Securiora) Cross Source com: Shift OS Cross Source chair 302 CEE 20E LE COM Time: Bl.z. cpm RCT EMP. Nel Source com: RCT: Emp. /_ *Cmot. (Print Name / Signature) (Print Name / Signatures Shift MZ Cross Source cpm: Spin 23 Cron Source com: Blg. (pm: Btg. cpm; Time: RCT Emp. F_ RCT Emp 6 Net Source operation %Ermr_ (Perat Name / Signature) (Priat Name / Signature) Shin M6 Crea Source cpa: Cross Source chas -----0/000 Big opa. الدر بوس RCT Emp. #_ Net Source coal (Prior News / Sentrari) %Erroc.___ Shift D6 Cross Source Com: Shilt PZ Cross Source comb--- . Bkg.cpm Time-Net Source char: RCY Emp. F. C VC Source cours (Print Name / Signature) (Print Name / Signature) %Emc_____ (Print Name / Signature) ZWWW. Spirit P6 Coat Source opa: Ç ಭಾಗ್ಯಾಕ್ ನಿರ್ವಾಧಿ ಮಾಗ್ರಿ Blog.cpm. Time: RCT EMP.F RCT Emp. F. Net Source com Net Source come (Print Name / Signature) . (Prior Name / Signature) Grou Source cpm; SPIU DI Cross Source com: Bie cpar get AF BLC. com: Time: RCT Emp. # Nic Source cpm: (Print Name / Signature) RCT Emp. # Y. Ecroc: Musion My (Priat Neme / Signature) Shill P3 Cross Source com: Crow Source com: Time: Bkg. com: RCT Emp. = Nei Source com: ₹Emc____ (Scient Name / Signature) Cross Source epm: ft-...com (Print Name ! Signature) Shift Att., Cross Source com: 84. cpm; Bkg. com: Time: Nei Source com; RCY Emp. # Net Source com: X.Error: (Print Name / Signature) (Print Name / Signature) ift D4 Crost Source com:___ % ERROR= (Net cpa/E)-Source dpa x 100 Btc. cpm: ... Net Source Cpm:_ Source dpm Net cpm = gross - background cpm E = Efficiency=0.33 for the SAC. 4 and 0.25 for the BC-Approved by Emp.

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ROCKY FIXIS ENVIRONMENTAL SEGUNOLOGY SITE

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8-19-99

Approved by

Cinnaine

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ROCKY FEATSENVIRONMENTALITE GUNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOC

MYSTURMENT MODEL: (Circle One)	ALPHA G BETA C
	rial No. 835 Calibration Due Date: 10.37
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Siart Date: 8-16-99 End Date: 8-	22-99 Building: 549 Location: office
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1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

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2. Acceptable range is a +20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be I minute in duration.

NOTE

If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

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SWIPE-COUNTER PERFORMANCE LOC INSTURMENT MODEL: (Circle One) ALPHA [] BETA: Ca SAC-4 (BC-4) CUDLUM 2929 Counter Serial No.: BC 770 Calibration Due Date: 1-7 Start Daie: 8-16-99 Building : _ 549 End Date: 8-22-79 Location: Source: SN 60392-7 D. P. M.: Certification Due Date: 114 11142 Shift P4 a Crott Zonccc cbas Grass Source comb Tione: Gite. com: Time წ**ს**უ. და: RCY Cmp. 5 RCT Emp. Net Source com: Not Source opa: ,%Emoc. XEmor. ' (Prior Keme / Signe ture) (Priat Name / Signature) Shift D1 Cross Source cpra; ZM DIÁŽ Cris Source cpm: Tiac 862.cpa: Tions. Big com: Merry? RCT Emp. Yet Source cpm: Net Source creat 7-Leac "AErroc (Prior Name / Signature) · (Proc Name / Secarcaco) Shift P1 Cross Source com Cross Source com 303 966 2064, com TIME: FOX NO. Time: Big. com: RCT EMPLE Net Source com: RCT Emp. /_ %Error (Print Mame / Signature) (Print Name / Signatures Shift MX CLON BOALLE Char Cross Source cpaz Stints Ble. cpm: Time: Btc. cpm; Time RCT Emp. F_ RCT-Emp F Net Source Com Not Source comen (Priat Nemc/ Sizantore) (Peiat Name / Signature) R DZ . Cross Source characteristics Shin M6 Cross Source com Bkc. com: RCT Emp. #_ Net Source epac RCT Emp. 4 -కాయి సముంచెనిగ %Error_ ...(Priqt Neme/Steament) (Print Name / Sentari) Criq (rames and Shift PZ Cos Source com?--Cross Source com: Time Bkg_cpm=__ 8 **₩**. Фа Net Source ena: RCT Emp. F RCT Emp.= C. Norsource cpm: (Print Name / Signature) %Emc___ (Print Name / Signature) : TON 11 IN Shill P6 Cross Source cpm: Time Blog. com 8kc-cp@ Time___ RCT EMP. F RCT Emp. --- Nct Source cpas Net Source char (Print Name / Signature) (Priot Name / Signature) SPIG DI Shift M7 Cross Source com; Nel Source cpar Time: BLC. com 0 RCT Emp. 4 MUNGOT! (Print Name / Signature) Y Error: M. (Prior Name / Signature) Shift 07 Crau Source com: Time: Der. com Shift P3 Cron Source com: Time: RCY Emp. 6 Nei Source com: Y. Error. Time; 8kg. com: __ RCT Emp. c_ Nei Source com:___ 7-Emc-(Print Name ! Signature) (Print Name / Signature) Shift Af4, Cross Source com Cross Source com: Yime: Ekt. com: Bkg.com: RCY Emp. # Net Source com: (Print Name / Signature) (Print Name / Signature) ic Dx Cross Source com: % ERROR = (Net cpa/E)-Source dpa x 100 nc: 0000 Bkr. cpm: ... _T Emp. # Not Source Com: Source dpm

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(Print Name / Signature)

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SWIPE COUNTER PERFORMANCE LOG

			
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SWIPE COUNTER	PERFORMANCE LOC :
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CACA BC 4 / LUDLUM 2929 Counter Serial No.	8:35 Calibration Due Date: 10-26-49
Carboni Esta Control Services	Building: 549 Location: Office
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7

Sanford Cohen & Associates Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number: 99AE967

Project Name: Kaleer-Hill

Chain-of-Custody Number: PSABS678002

Matric Waste

Site Sample ID: 003.002

Other Sample ID: T112 B NW CORNER

Collection Data: 7/21/99

Date Received: 7/27/99

Batch Number: 1843

Laboratory Code: SCA

Activity 2 or Counting Error Total Error MDA Laboratory Mathrad Number (bCl/s) Radionucida (pCl/g) (oCl/o) Semole ID (8/i3a) **ACW03** U-233/234 KH109-1843-03 0.030 0.049 0.050 0.076 ACVVO3 0.000 0.000 0.000 U-235 KH199-1643-03 0.045 **AÇVV03** U-238 KH198-1843-03 0.035 0.048 0.048 0.064 ACW03 PU-238/240 KH199-1643-03 0.022 0.044 0.044 0.059 ACW03 AM-241 KH199-1543-036 2.37 0.740 0.878 0,119

Quality Control Samples						
Badionucide	Laboratory Control Sample (LC)	Laboratory Duolicate Analysis (LD)	Properation Blank (PB)			
ប	8CAQC-1843-LC1	SCAQC-1643-LD1	5CAQC-1643-PB			
Pu	5CAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB			
Am ·	6CAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1843-PB			

PRELIMINARY INECEMATION

Redicanalytical Results

Report Identification Number: 99A8967

Project Name: Kniger-Hill Chain-of-Custody Number: 99A89678002 Metric Waste São Sample ID: 004.002 Other Sample ID: T112 BINE CORNER Collection Date: 7/21/89 Date Received: 7/27/99 Satch Number: 1643 Laboratory Code: SCA

		Laboratory	Activity	2 o Counting Error	Total Error	MDA
Method Number	Radionsciide	Sample 10	(oCVo)	(pCVg)	(bCl/4)_	(pG/b)
ACW03	U-233/234	KH199-1643-04	0.068	0.061	0.062	0.037
ACW03	U-235	KH199-1643-04	a.017 ·	0.033	0.034	0.046
ACW03	U-238	KH199-1643-04	0.013	0.027	0.027	0.037
ACW03	PU-239/240	KH199-1643-04	-0.010	0.020	0.020	0.117
ACW03	ANI-241	KH199-1643-04B	0.000	0.000	0.000	0.088

Quality Control Samples Radionucido Laboratory Control Sample (LC) Laboratory Duolicate Analysia (LD) Preparation Blank (PB) SCAQC-1643-LC1 SCAQC-1843-LD1 SCAQC-1943-PB Pu SCAQC-1643-LC1 8CAQC-1643-LD1 3CAQC-1643-PB SCAQC-1643-LC1 SCAQC-1843-L01 Aπ SCAQC-1643-PB

PRELIMINARY

Radioanalytical Results

Quality Control Sample Preparation Slank (PB)

Report Identification Number: 99A8957

Project Name: Kaiser-Hill

Chain-of-Custody Number: None

Matrix: Water

Site Sample 10: N/A

Other Sample ID; PB

Collection Date: 7/27/99

Data Received: 7/27/99

Laboratory Code: SCA

Mathod Number	Rectionschide	Laboratory Sample ID	Activity (dom)	2 or Counting Error (dom)	Total Error	MDA (dom)
ACW03	U-233/234	SCAQC-1843-PB	0.043	0.049	0.050	0.039
ACWOS	U-235	SCAQC-1643-PB	0.000	0.000	0.000	0.048
ACW03	U-238	SCADC-1643-PB	0.079	0.071	0.072	0.068
ACW03	PU-239/240	SCAQC-1643-PB	0.000	0.000	0.000	0.056
ACW03	AM-241	SCAQC-1643-PW	0.000	0.000	0.000	0.053

		Quality Control Samples	
Badionucid	E Laboratory Control Sample (LC)	Leboratory Duplicate Analysis (LD)	Preparation Blank (PS)
l u	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAOC-1843-PB
Pu	\$CAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB
Am	8CAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1843-P8

Radioanalytical Results

Quality Control Sample Evaluation

Report Identification Number: 99A8967

Project Name: Ketser-Hill	Laboratory Code: SCA

		Labor	atory Contol Sam	pie (LC1) Evaluatio	n	·
			(CV)			
		Laboratory	Decay Corrected Activity of Splice Added	(OV) Listocratory Control Sumple Activity	Laboratory Control Sample % Recovery	Number of o
Method Number	Radionucida	Sample ID	(dpm)	(dom)	_(Accument)	Between CV and CV
ACW03	AM-241	SCAQC-1843-LC1	4.24 ¥ 0.117	4.38 _¥ 1.17	103	0.191
ACW03	PU-239/240	SCAQC-1643-LC1	4.55 ₇ 0.100	5.13 # 1.37	113	0.673
ACW03	U-233/234	BCAQC-1643-LC1	8.02 = 0.321	7.28 _∓ 1.75	90,3	0.660
ACW03	U-238	SCAQC-1643-LC1	8.02 ₌ 0.321	7,74 ± 1.86	96.4	0.231

		Laborat	Retio of the Difference Between the Sample Activities and the			
Method Number	Redionucikie	Laboratory Sample ID	Original Sample Activity (pCl/g)	Duplicate Sample Activity(pCl(g)	Difference Between Original Activity and Duplicate Sample Activity	Propagated Measurement Original Activity and Uncertainty of the Difference at 2 or
ACW03	U-233/234	SCAQC-1643-LD1	0.264 + 0.129	0.244 ± 0.133	0.020	0.108
ACW03	U-235	SCAQC-1843-LD1	0.016 + 0.031	0.018 + 0.037	0.003	0.055
ACW03	U-238	SCAQC-1643-LD1	0.270 _# 0.132	0.170 + 0.109	0.100	0.687
ACWas	PU-239/240	SCAQC-1643-LD1	0.000 = 0.000	0.041 + 0.059	0.041	0,696
ACW03	AM-241	SCACC-1643-LD1	0.000 🛫 0.000	0.054 ± 0.078	0.054	0.695

•	RIN: 1140967 WASTE STREAM ID: NIA
	EVENT: 001 CUSTOMER SAMPLE ID:
	DUPLICATE ID: NA FIELD BLANK ID:
	ISSUE DATE: 7/19/49 EQUIPMENT BLANK ID:
	TRIP BLANK:
	Company of the Tenant of the T
	Comments/Problems encountered during sampling: 10mp in upper 805 Slight breeze. Tar roof excells temp. Sample taken in
	Slight orecze. lar voot excells temp. Sample taken in
and and P	4 inch squares.
con con Kaa	(ScreanFinal measurement 12" × 16" area taken for
	Sample at 126 grams - Isotopk 001.002 wt 144 grans 12'x16' area
	Location Description: T 112 A CENTER
	Other ID: Center Sample location
	Sample Appearance: Black solid Chunks with silver material
	present. Sample Could contain tar.
	Sampling Device: Stainless Staper
	7-21-99
	Sample Date: 7-21-99 Sample Time: 1200 Rad Screen Date: 1200 era
	Sample Date. 1-31-77 Sample Time: 1200 Raa Screen Date: 1200
	Was generator notified to receive excess sample? (YES) (NO)
	Was generator notified to receive excess sample? (YES) (NO)
	and the second
	Samplers Signature: Phunt D. T.
	Employee Number:
	Date: 7-21-99 7.21.99

KIN: <u> </u>	
EVENT: <u>602</u>	CUSTOMER SAMPLE ID:
DUPLICATE ID: N/A	FIELD BLANK ID:
ISSUE DATE: 7/19/99	EQUIPMENT BLANK ID:
	TRIP BLANK:
	The special states
Comments/Problems encountered	during sampling: Temp in upper 80°5, Sight bree
	igrams taken in 12 x 16 mch area
Esotopic 002.002 w+ 120	1 grams taxen in 12 x 16 inch arra
Tax Roof excells temper	atur.
Location Description: 7/12	A
cocarron ocscription	
	<u> </u>
	1st Corner
Other ID: South W.	est Corner.
Other ID: South Wo	
Other ID: South Was	gold Chunk Some Silver material
Other ID: South Was	
Other ID: South Wo	gold Chunk Some Silver material
Other ID: South Was	gold Chunk Some Silver material
Other ID: South We Sample Appearance: Black Prosent, Sample Could	golid Chunk Some Silver material
Other ID: South Was	golid Chunk Some Silver material
Other ID: South Wassers Sample Appearance: Black Prosent, Sample Could Sampling Device: Stain 1.55	Soud Chunk Some Silver material Contam tar Scraper
Other ID:South Wassenstern Sample Could Sampling Device: _Stain less	golid Chunk Some Silver material
Other ID: South Wassers Sample Appearance: Black Prosent, Sample Could Sampling Device: Stain 1.55	Soud Chunk Some Silver material Contam tar Scraper
Other ID:South Was Sample Appearance: Black Prosent, Sample Could Sampling Device: Stain 1.55 Sample Date: 7-21-99	Sample Time: 1230 Rad Screen Date: 7-21-89
Other ID: South Was Sample Appearance: Black prosent, Sample Could Sampling Device: Stainless	Sample Time: 1230 Rad Screen Date: 7-21-89
Other ID: South We Sample Appearance: Black prosent, Sample Could Sampling Device: Stainless Sample Date: 7-21-99	Sample Time: 1230 Rad Screen Date: 7-21-89
Other ID: South We Sample Appearance: Black present, Sample Could Sampling Device: Stainless Sample Date: 7-21-99 Was generator notified to receive	Sample Time: 1230 Rad Screen Date: 7-21-89 The excess sample? (YES) (NO)
Other ID: South Was generator notified to receive	Sample Time: 1230 Rad Screen Date: 7-21-89 The excess sample? (YES) (NO)
Other ID: South We Sample Appearance: Black prosent, Sample Could Sampling Device: Stainless Sample Date: 7-21-99 Was generator notified to receive	Sample Time: 1230 Rad Screen Date: 7-21-89 The excess sample? (YES) (NO)
Other ID: South Was generator notified to receive Samplers Signature:	Sample Time: 1230 Rad Screen Date: 7-21-89 re excess sample? (YES) (NO)

RIN: 49 H 7 10 1	WASTE STREAM ID:
EVENT: 00.3	CUSTOMER SAMPLE ID:
DUPLICATE ID: NIA	FIELD BLANK ID:
ISSUE DATE: 7-19-99	EQUIPMENT BLANK ID:
	TRIP BLANK:
•	
Comments (O. 11)	1 and 1 add 1 1 1 1 acc
Comments/Problems encountered of	during sampling: on ladder while taking
Sample . Irmp upper &	o's problems out sample.
	55, 4×16 inch sample used.
150 topic 003.002 125 gran	ns, 4x16 Inch sample used.
	<u> </u>
Location Description: 7 //2	-B
	<u> </u>
	·
	•
Other ID: North We	est Corner
	•
Sample Appearance: Gray me	etal light gauge
Sampling Device: In Snuss	
Sample Date: 7-21-94	Sample Time: 1300 Rad Screen Date: 7.21 99
Sample Sale. 1 At 11	xample time. 7 000 Kad Screen odle. 7 87 77
Was generator notified to receive	avenes complet (VES) // (NO)
was generator notified to receive	excess sample? (YES) / (NO)
Samplane Sinual BA	T AT L
Samplers Signature:	Jan Deligation
Employee Number:	
7-21-99	,
Date:	

RIN: 494896 /	WASTE STREAM ID: WIA-
EVENT: 004	CUSTOMER SAMPLE ID:
DUPLICATE ID: NIA	FIELD BLANK ID:
ISSUE DATE: 7-19-99	EQUIPMENT BLANK ID:
	TRIP BLANK:
	•
Comments/Problems encountered d	during sampling: Trmp lower 90's Sampled
on a ladder. Problems	Collecting sample
Radscreen 004001-127 gra	ms 6x16 inch sample used.
	ms lox8 inch sample used
Location Description: 7/123	
an an iball — a	
Other ID: North La	st Corner
Sample Appearance: Crey M	on metal.
a siliconcitype give	on metal.
Campling Davison Tree 5	
Sampling Device: Im Say	
Sample Nata: 7-71 59	Sample Time: 1315 Rad Screen Date: 7-21-99
Sample oute. 7 CT 77	sumple time. 7.373 Rad Screen bate. 7 21 77
Was generator notified to receive	excess sample? (YES) (NO)
was generator notified to receive	excess sampler (703)
Samplers Signature: <u>Ald u</u>	MT DI
Employee Number:	ALA SON
Chiproyee Homoer.	
Date: 7-21-99	7-21-99

SAMPLE SUMMARY FOR RIN: 99A8967

RIN Title:	NA	Sampling Team:					CAS		
Project Name:	D&D PROJECTS	•	Sampling Mgr/Coordinator:					Paul Wostascek	
Task Name:	T-112				Sa	mplers:			
Aggregate Area:	NA	•	••••		Field Logbook ID:		94 Van		
		Media: SOLID							
This sample summary	is supplied to waste ge	nerators as notificat	ion of sample collection	on. Inquires into the	status of this s	ampling effo	ort may be directed	to the Analytical Services Division (ASD).	
Bottle Number	Customer Bottle Number	Location	LIC (See Attached)	Laboratory	Date Collected	Date Shipped	Date Returned	Comments	
99A8967-001.001		T-112	1	Thermo NuTech	A				
99A8967-001.002		T-112	2	S. Cohen & Associates					
99A8967-002.001		T-112	1	Thermo NuTech					
99A8967-002.002		T-112	2	S. Cohen & Associates					
99A8967-003.001		T-112	1	Thermo NuTech					
99A8967-003.002		T-112	2	S. Cohen & Associates		·			
99A8967-004.001		T-112	. 1	Thermo NuTech	,		·	-	
.99A8967-004.002		T-112	2	S. Cohen & Associates					
eturning Excess Samp									
federal regulations.	Deculatory evaluations	for returning excess he Environmental Co	sample material are	specified in the Cod eration area should	le of Colorado R be contacted fo	legulation (C	CR) 1007-3. Part 2	excess sample material for applicable state and 261.4(d) 'Samples'. If problems with the disposal of a sample material which has not been modified	

Pana WOSTASZOK

Sign and Print Name)

omments:

1-- H--- Cadaa

OS01A003

(Rad-Screen - Solid)

2) RC01B003

(Isotopic (Soil))

142

TITLE:

Date: 7/19

6:59 PM

SAMPLE SUMMARY FOR RIN: 99A8967 RIN Title: Sampling Team: MAN Paul Wojtacek Project Name: D&D PROJECTS Sampling Mgr/Coordinator: Task Name: T-112 Samplers: Aggregate Area: Field Logbook ID: 94 Van Media: SOLID This sample summary is supplied to waste generators as notification of sample collection. Inquires into the status of this sampling effort may be directed to the Analytical Services Division (ASD). LIC Bottle Number Customer Location · Laboratory Date Date Date Comments Bottle Number (See Attached) Collected Shipped Returned 99A8967-001.001 T-112 Thermo NuTech 7-21-99 7-21-99 TIIZA Conter T-112 2 99A8967-001.002 S. Cohen & Associates T-112 99A8967-002.001 Thermo NuTcch TIIZA SW COMPET 99A8967-002.002 T-112 2 S. Cohen & Associates T-112 Thermo NuTech 99 1 8967-003.001 TIIZB NWG-WC T-112 99A8967-003.002 S. Cohen & Associates 99A8967-004.001 T-112 Thermo NuTech 1128 NECONAL 99A8967-004.002 T-112 2 S. Cohen & Associates Returning Excess Sample Material: Unmodified sample material remaining after analysis is generally returned to the generator. The generator must be prepared to receive and dispose of excess sample material for applicable state and federal regulations. Regulatory exclusions for returning excess sample material are specified in the Code of Colorado Regulation (CCR) 1007-3, Part 261.4(d) 'Samples'. If problems with the disposal of excess sample material are encountered, the Environmental Coordinator for the generation area should be contacted for resolution of the issues. Only sample material which has not been modified during analysis will be returned. Material which has been acidified for preservation purposes will not be returned. Customer Acknowledgement: (Sign and Print Name) Comments: Line Item Codes: (Rad-Screen - Solid) OS01A003 (Isotopic (Soil)) RC01B003

Date: 7/1' __1:17:00 PM

Thermo Nutcon - Rocky Flats Radscress) Results



Distribution/Fax: ASD/ 4558

RIN: Analysis

Report Date:

99A3967 Radscreen 07/25/99

Laboratory		APO Sample ID			Gross Aipha Gross Retained					
Sample (D	RIN	Event	Bottle	Matrix	pClfq	20		s Beta	Total Activity	DOT
99070249-01	99A8967	001	001	Waste			pCh ^a	2.5	pCl/g	Class
99070249-02	99A8967	002			5.6	3.2	9.3	3.1	21.20	NONRAL
			001	Waste	3.6	2.2	4.0	21	11.90	
99070249-03	99A5967	003	001	Waste	3.8	6.3	11.0			NONRAL
99070249-04	99A8967	004	001	Waste	5.3			7.0	28.10	NONRAL
						5.0	-0.8	4.2	14.50	NONRAD

DOT Classification

<2000 pCl/g total activity is NONRAD</p> >= 2000 pClig total activity is RAD

Total Activity

Calculated as the sum of the gross alpha and beta activities AND the measurement uncertainties for these two measurements. If the measured activity is negative, 0 pCVg (instead of the negative value) is used to calculate the total activity.

Analysis Nethods

Sample Preparation Procedures: ATP-005, "Preparation of Oils, Solvents and Combustibles for Analysis of Gross Alpha and Beta Activity" (1 g aliquol) and

L-5278-A, "Sample Preparation for Radiological Screening by Gas Proportional Counting". Counting Procedura: ATP-008, "Operation of Tennelec LB4100 Gas Proportional Counters".

Thoma Muleon - Floorly Flech RETE-BIOLOG THOO Gotton Courset #0432 (307) MET-6260



KAISER+HILL
company
analytical services division

FAX COVER SHEET FOR PRELIMINARY DATA REPORTS

RIN NUM	BER: 4948967	<u> </u>
FROM:	TOM SZYDLOWSKI	
PHONE:	(303) 966-8165	
FAX:	(303) 966-4555	·
TO:	Wojtaszek	
FAX:	4046	
PHONE:		
NUMBER	OF PAGES, INCLUDING COVER SHEET:	
Diagram		
Please con	(phone number) if the fax is not received in its entire	ty. /

NOTE:

If the accompanying data is stamped preliminary it is because the final data package has not been received and validated or verified. Until the data is validated or verified it must be considered preliminary. Final data is usually not received until 30 days after the laboratory has received the sample. Verification or validation is completed a short time following receipt of the final data package. You will be sent a copy of the verification or validation report, which you should review. If qualifiers have been attached to individual results they may affect the way that you use the data. If you have any question please contact your Analytical Services Project Lead, do not contact the laboratory directly.



Best Available Copy

ANALYTICAL SERVICES DIVISION SAMPLING AND ANALYSIS REQUEST FORM

RIM: 99A896 Fibrily: Rush ASD USE ONLY
ASD Project Lead. Szy oflowski Phone: 8/65. Pager:
CUSTOMER INFORMATION
Date: 07/19/99
Project Charge No.: 150/04-20
Requestor: PAVL A. WOJTASZEK Prone: x 3/25 Pager:
Bidg: <u>7893B</u> Fax: <u>x 4046</u>
Secondary Contact: DAVE BARNES Proce: x 5352 Pager: 212-6541
Bidg: 1/30/3 Fax:
Fax Data Results To: PAVE A WOULSTEEK Prone: x 3125 Fax: x 4096
Sample Location: T112 A, 7-112 B SAMPLE INFORMATION
Sample Description and
Sample Identifiers
Sample Matrix: Aqueous Corg. Equi X Solid Sludge Mutti Phase
When will sample be available for sampling? 6-00 AM 11165, 07/20/97
When is data required by requestor? 08/06/99 - 195/11P
Estimates quantity Available for Sampling:
Waste Stream ID No. (if known) Waste Stream Name (if known)
EPA CODES: MSDS. Yes No ATTACHED: Yes No
90 Day Area?
ANALYSES REQUESTED
Majohar Sorean Total VOA TCLP VOA De PH Other Corean Alphar Geta SVOAS Total SVOAS TCLP SVOAS Fingerprint
Gross Alpha/Geta
Total PCBs Total PCBs Analyses Criticality Sensitive? Yes No
Control of the contro
L.: Gamma Socio 1 Total Herbicides L.: TCLP Herbicides (FYes Double Double
RADIOLOGICAL ENTRY REQUIREMENTS
IS THIS A RADIOACTIVE WASTE STREAM? Suspected to be radioactive? (2) Yes (3) No
Pu Am U Other
Located to: C RBA C RMA C RAMMA C CA C HCA C RA C HRA Other Area.
RCT Support: (Yes (No Comments
RWP Required: Yes (No
PINSE Required: Yes No
CENERAL ENTRY REQUIREMENTS/SAFETY CONCERNS Replaced the Day Replaced the Day CENERAL ENTRY REQUIREMENTS/SAFETY CONCERNS Replaced the Day
To Maintenance Assistance Carcinogen Control Area To Maintenance Assistance
Coparator's Assistance
Simplier reform paget savers training. The many
be two (2) somplors with this training.
Requiester Signature: Well Wing Joseph Date: 07/19/79
Note: Excess sample will be returned to generator.

ANALYTICAL SERVICES DIVISION SAMPLING AND ANALYSIS REQUEST FORM

ASD USE ONLY	
RIN: 99A8967 Priority:	
ASD Project Lead: SZYDLOWSKI, TOM Phone: 8165	Pager:
CUSTOMER INFORMATI	ION
Date: 07/19/1999	. •
Project Charge No.: 02017100	
Requestor: WOJTASCEK Phone: 3125	
Bldg:	Fax:
Secondary Contact: BARNES, DAVE Phone: 5352	Pager:
Bldg:	Fax:
Fax Data Results To: WOJTASZEK Phone: 4046	Fax:
SAMPLE INFORMATIO	N .
Sample Location: T-112	
Sample Description and Roffing material Sample Identifiers	
Sample Matrix: Aqueous Org. Liquid Solid	Sludge Multi Phase
When will sample be available for sampling? 07/20/1999	
When is data required by requestor? 08/05/1999	<u>-</u>
Estimated quantity Available for Sampling:	•
	Name (if known):
EPA CODES: MSDS: Yes No	ATTACHED: Yes No
COMPATIBILITY CODE WFC/ IDC:	5.10
90 Day Area? () Yes (No Start Date:	End Date:
ANALYSES REQUESTE	D
Alpha/Beta Screen Total VOA TCLP VOA	pH Other:
Gross Alpha/Beta Total SVOAS TCLP SVOAS	Fingerprint
✓ Isotopics	IR ·
g/l Isotopics Total PCBs TCLP PCBs	Analyses Criticality Sensitive? () Yes (i) No
Gamma Spec Total Herbicides TCLP Herbicides	If Yes: Single Analyses: Double
PARIOTOCICAL ENTRY PROU	
RADIOLOGICAL ENTRY REQUI IS THIS A RADIOACTIVE WASTE STREAM? Suspected to be	
	U Other:
Located In: RBA RMA RMMA CA HCA	
RCT Support: (a) Yes (b) No Comments:	
RWP Required: () Yes () No	
PWRE Required: (•) Yes () No	
. GENERAL ENTRY REQUIREMENTS/SA	FETY CONCERNS
Plan of the Day Industrial Hygiene Assistance	Electrical
Maintenance Assistance Carcinogen Control Area	[IWCP
Operator's Assistance Lock-out/Tag-out	Confined Space
Mechanical Waste Contains Fluorides	Other:
Special Instructions: Both persons sent to sample this job must have curre	nt ladder safety training,
// / / / / /	
Requestor Signature:	Date: 07/21/99
Note: Excess sample will be returned to generator.	

Commod Sciences,	ore Advanced Inc.			CHAIN	OF CUSTO	DY/S	AMPL	E ANALYSIS	REQUES	į.	.O.C. # 99	A8967#002
Collector	-44	'A	· _/_	Co	ontact/Requester				Telephone No.	MSIN	TA FAX	_
RIN .	067	١	10	Sa	WOJTASCEK mpling Origin			·	Purchase Orde	r/Charge Code) 74	
Project Title	907				T-112 gbook No.			,	02017100 Ice Chest No.	Tc.	مراد سم	1
	NA		·		94	<u>Van</u>				NA_		<u></u>
	Cohen & Associates	S		M	ethod of Shipment	Eed.	EX.		Bill of Lading/			
Protocol	18-50P. O	03				÷		. ·	Offsite Proper	ty No.		
POSSIBLE SA	MPLE HAZARDS/REI	MARKS Pos	5,ble	Torpi	esent in s	ample s	PECIAL IN	STRUCTIONS 116	old Time	Total Activity I	Exemption:	Yes . No · :
Bottle No.	Customer Number	Matrix	Date	Time	Location	No/Ty	pe Container		Sample Ana	lysis		Preservative : Packing
99A8967-	1	SOLID			T-112	125-G	P/G	RC01B003 (Isotop	ic (Soil)) [Rus	hì .		None
001.002	TIZA Conter		7-21-9	1/200					77 (77	•		4 degrees C
99A8967-		SOLID	1		T-112	125-G	P/G	RC01B003 (Isotop	ic (Soil)) [Rus	h)		None
002.002	TIIZA S.W.			1230								4 degrees C
99A8967-	N.W	SOLID			T-112	125-G	P/G	RC01B003 (Isotop	ic (Soil)) [Rus	h]		None
003.002	TIMB Corner			1300								4 degrees C
99A8967- 004.002	N.E TIIZB Corner	SOLID		1315	T-112	125-G	P/G	RC01B003 (Isotop	ic (Soil)) [Rus	h]		None 4 degrees C
					164-7	7-21-9	9					
			<u> </u>			 						
				·								
Relinquished By: Relinquished By:		Date/Time 9 1500	Received	#2 T8	791R 721-4	Date/Time	Relinquishe		Date/Timé	Received By:		Date/Time
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Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Tracer Yield

Report Identification Number: 99A8967

Project Name: Kelser-Hill

Laboratory Code: BCA

Laboratory Sample ID	<u>Am-243</u>	Pu-242	U-232
KH199-1643-01	43.21	80.72	91.08
KH199-1643-02	69.25	75.38	96.53
KH199-1643-03		62.71	89.6
KH199-1643-038	63.56	•	
KH199-1843-04		55.87	88.32
KH199-1643-04B	84.4		
SCAQC-1643-LC1	91.28	85.99	91.91
SCAQC-1643-LD1	47.A2	65.78	82.86
SCAOC-1643-PB	77 91	68.52	93.83





KAISER • HILL COMPANY ANALYTICAL SERVICES DIVISION

FAX COVER SHEET FOR PRELIMINARY DATA REPORTS

FROM:	TOM SZYDLOWSKI
PHONE:	(303) 966-8165
FAX:	(303) 966-4555
го:	Wojtaszek
FAX:	4046
PHONE:	
NUMBER	OF PAGES, INCLUDING COVER SHEET:

NOTE:

If the accompanying data is stamped preliminary it is because the final data package has not been received and validated or verified. Until the data is validated or verified it must be considered preliminary. Final data is usually not received until 30 days after the laboratory has received the sample. Verification or validation is completed a short time following receipt of the final data package. You will be sent a copy of the verification or validation report, which you should review. If qualifiers have been attached to individual results they may affect the way that you use the data. If you have any question please contact your Analytical Services Project Lead, do not contact the laboratory directly.

Appendix 4

Radiological Survey Data for Interior and Exterior of Trailer T112C (Survey Unit C)

APPENDIX 4 - Survey Unit C (T112C)

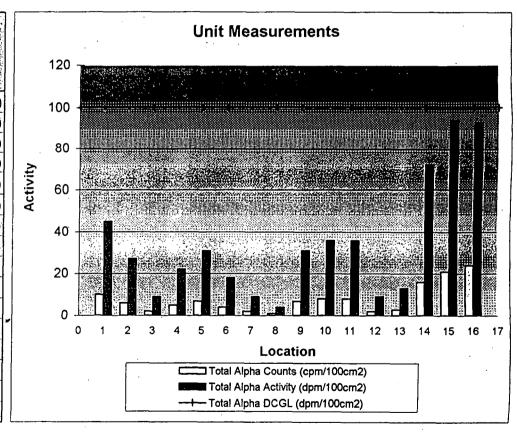
- Survey Unit C Data Summary
- MARSSIM Calibration/Verification Worksheet
- Total and Removable Radiological Survey Results
- Performance Test Logs
- Survey Package Cover Sheet
- Sampling and Survey Instructions
- Grid Survey Map



August 19, 1999

					8/5/1999	8/19/99
standard deviation:	28.67686	max:	94.0	Instrument background:	0 cpm	3 cpm
mean:	34.3125	min:	4.0	Instrument efficiency:	22.3 %	. 22.5 %
median:	29			Instrument MDA:	33 dpm	48 dpm

	Surface	Lo	cation	Grid :	Counts (cpm/100cm²)	Total Alpha Activity (dpm/100cm²)	DEGL
1	Room	1	Floor	B4	10	45	100
2	Room	1	Floor	C2	6	27	100
3	Room	1	Wall	D1	2	9	100
4	Room	1	Wall	E2	5	22	100
5	Room	2	Wall	K2	7	31	100
6	Room	3	Wall	E1	4	18	100
7	Room	3	Wall	J2	2	9	100
8	Room	3	Wall	L1	1	4	100
9	Room	4	Wall	E2	7	31	100
10	Room	5	Wall	B2	8	36	100
11	Room	5	Wall	H1 '	8	36	100
12	Room	5	Wall	11	2	9	100
13	Room	7	Wali	C1	3	13	100
14	Exterior	Ν	Wall	J3	. 16	72	100
15	Exterior	s	Wall	G1	21	94	100
16	Exterior		Roof	M3	24	93	100





August 19, 1999

8/5/1999 8/19/99

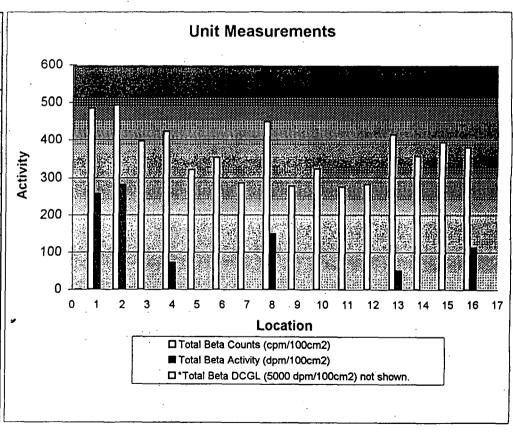
 standard deviation:
 220.1215
 max:
 281.0
 Instrument background:
 398 cpm
 346 cpm

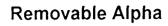
 mean:
 -75.8125
 min:
 -364.0
 Instrument efficiency:
 33.5 %
 30.4 %

 mean:
 -75.8125
 min:
 -364.0
 Instrument efficiency:
 33.5 %
 30.4 %

 median:
 -67
 Instrument MDA:
 285 dpm
 294 dpm

	Surface	Lo	cation	Grid Location	Total Beta Counts (cpm/100cm²)	Total Beta Activity (dpm/100cm²)	Total Beta DCGL (dpm/100cm²)
1	Room	1	Floor	B4	484	257	5000
2	Room	1	Floor	C2	492	281	5000
3	Room	1	Wall	D1	396	-6	5000
4	Room	1	Wall	E2	422	72	5000
5	Room	2	Wall	K2	321	-230	5000
6	Room	3	Wall	E1	352	-137	5000
7	Room	3	Wall	J2	286	-334	5000
8	Room	3	Wall	L1	448	149	5000
9	Room	4	Wall	E2	277	-361	5000
10	Room	5	Wall	B2	323	-224	5000
11	Room	5	Wall	H1	276	-364	5000
12	Room	5	Wall	11	282	-346	5000
13	Room	7	Wall	C1	415	51	5000
14	Exterior	Ν	Wall	J3	357	-122	5000
15	Exterior	S	Wall	G1	394	-12	5000
16	Exterior		Roof	M3	380	113	5000

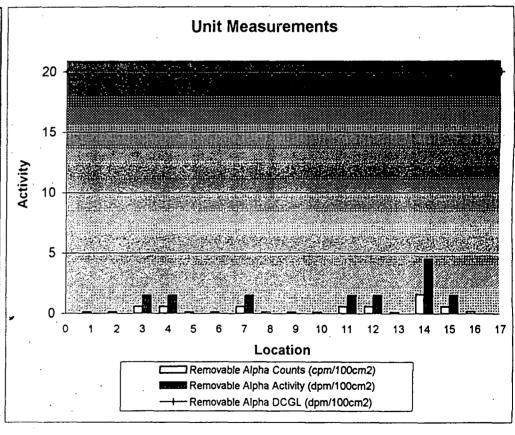


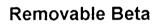


August 19, 1999

				·	8/5/1999	8/19/99	ļ
standard deviation:	1.220912	max:	4.5	Instrument background:	0.1 cpm	0.2 cpm	
mean:	0.84375	min:	0.0	Instrument efficiency:	33 %	33 %	
median:	0 -			Instrument MDA:	6.5 dpm	7.5 dpm	

	Surface	Lo	cation	Grid Location	Alpha	Removable Alpha Activity (dpm/100cm²)	Removable Alpha DCGL (dpm/100cm ²)
1	Room	1	Floor	B4	0	. 0	20
2	Room	1	Floor	C2	0	Ö	20
3	Room	1	Wali	D1	1	1.5	20
4	Room	1	Wali	. E2	1	1.5	20
5	Room	2	Wall	K2	0	0	20
6	Room	3	Wall	E1	0	0	20
7	Room	3	Wall	J2	1	1.5	20
8	Room	3	Wall	L1	0	0	20
9	Room	4	Wall	E2	. 0	0	20
10.	Room	5	Wall	B2	0	0	20
11	Room	5	Wall	H1	1	1.5	20
12	Room	5	Wall	11	1	1.5	20
13	Room	7	Wall	C1	0	0	20
1.4	Exterior	Ν	Wall	J3	2	4.5	20
15	Exterior	S	Wall	G1	1	1.5	20
16	Exterior		Roof	M3	0	0	20

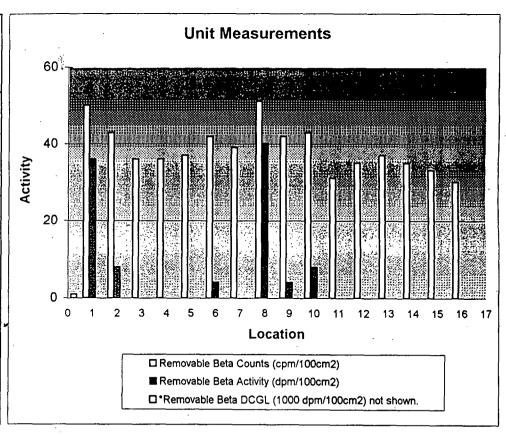




August 19, 1999

						8/5/1999	8/19/99
standard deviation:	23.9207	max:	40.0	ŧ	Instrument background:	41 cpm	40 cpm
mean:	-8.75	min:	-40.0		Instrument efficiency:	25 %	25 %
median:	-16				Instrument MDA:	200 dpm	200 dpm

	Surface	Lo	cation	Grid Location	Removable Beta Counts (cpm/100cm²)	Removable Beta Activity (dpm/100cm²)	
1	Room	1	Floor	B4	50	36	1000
2	Room	1	Floor	C2.	43	8	1000
3	Room	1	Wall	D1	36	-20	1000
4	Room	1	Wall	E2	36	-20	1000
5	Room	2	Wali	K2	37	-16	1000
6	Room	3	Wall	E1	42	4	1000
7	Room	3	Wall	J2	39	-8	1000
8	Room	3	Wall	L1	51	40	. 1000
9	Room	4	Wall	E2	42	4	1000
1.0	Room	5	Wall	B2	43	. 8	1000
11	Room	5	Wall	H1	31	-40	1000
12	Room	5	Wall	l1	35	-24	1000
13	Room	7	Wall	C1	37	-16	1000
14	Exterior	N	Wall	J3	35	-24	1000
15	Exterior	s	Wall	G1	33	-32	1000
16	Exterior		Roof	M3	30	-40	1000



Survey Area: T112 | Building: T112C

Survey Unit: C (T112C Exterior)

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the <u>Unit C</u> removable surface contamination data are calculated on the "<u>Survey Unit C Data</u>" sheet. Because all removable survey measurement results are less than DCGLw (alpha less than 20 dpm/100 cm², beta less than 1000 dpm/100 cm²), the survey unit clearly meets the removable contamination release criterion.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with α = 0.05 and β = 0.05. The number of sample points calculated was based on the use of this test.

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGL_w. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGL_w.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of smears with the ACTUAL survey unit standard deviation.

The actual removable survey standard deviations for <u>Unit C</u> are: α <u>2.38</u> β <u>23.9</u>

Thus, the ACTUAL required number of measurements is as follows:

α: $\Delta/\delta = (DCGL_{REMOVABLE} - LBGR_{REMOVABLE})/SD_{REMOVABLE}$

 $\Delta/\delta_{\text{transuranics}} = (20 \text{ dpm}/100 \text{cm}^2 - 10 \text{ dpm}/100 \text{cm}^2)/\frac{2.38}{2.38} \text{ dpm}/100 \text{cm}^2 = \frac{4.2}{2.38}$

ß:

Δ/δ = (DCGL REMOVABLE - LBGR REMOVABLE)/ SD REMOVABLE

 $\Delta/\delta_{\text{transuranics}} = (1000 \text{ dpm}/100 \text{cm}^2 - 500 \text{ dpm}/100 \text{cm}^2)/23.9 \text{ dpm}/100 \text{cm}^2 = 20.9$

Where: Δ/δ

is the relative shift or the resolution of measurements in units of measurement

uncertainty

DCGL REMOVABLE is the removable surface contamination derived concentration guideline value (DOE Order 5400.5

removable surface contamination limit equals 20 dpm/100cm² for transuranics per the T112A-C Pre

Demolition Survey Plan)

LBGR REMOVABLE is the lower bound of the gray region – the lower bound of the range of values of the parameter of

interest in a survey unit where the consequences of making a decision error is relatively minor (set equal

to value utilized in original sample size calculation).

SD REMOVABLE is the ACTUAL standard deviation of the removable surface contamination measurements

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals $\underline{0.998650}$ for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112 Building: T112C
Survey Unit: C (T112C Exterior)

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of removable surface contamination measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on radioactive contaminants of concern not being present in the background:

 $\alpha N = (1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$ $N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = \underline{10.9}$ $\beta N = (1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$

 $N = (1.645 + 1.645)^{2}/4(0.998650 - 0.5)^{2} = 10.9$

Where:

1.645

is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition

Survey Plan

Sign P

equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

N = 10.9 * 1.2 = 13

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of $\underline{13}$ α and β Removable Surface Contamination

measurements were required in Unit C.

Step 4:

Draw conclusions from the data: All measurements are less than DCGL_w. The minimum number of required removable survey measurements were collected. Thus, survey <u>Unit C</u> complies with the removable contamination release criteria.

D. A. BARNES	Ston	8-19-99
Prepared By: Printed Name	Radiological Engineer Signature	Date
ESTABROOKS	Montalals	8/19/19
Reviewed By: Printed Name	Radiological Engineer Signature	Date

Survey Area: T112 | Building: T112C

Survey Unit: C (T112C Exterior)

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the <u>Unit C</u> data are calculated on the "<u>Survey Unit C Data</u>" sheet. Because all total surface activity (TSA or TSC) measurement results are less than DCGL_W (less than 100 dpm/100 cm²), the survey unit clearly meets the TSA release criterion.

A graphical data review was also performed on the attached form. The posting plot indicated that spatial trends of elevated areas are not present. The histogram indicated that no isolated areas of elevated activity are present.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with α = 0.05 and β = 0.05. The number of sample points calculated (see "Total Surface Activity Measurement Calculation Worksheet") was based on the use of this test. A local area background (LAB) value was subtracted from each gross measurement to calculate a net result, thus the sign test applies (sign test is typically applied only when the contaminant is not present in background).

The performance of the sign test was not necessary due to the fact that each individual net result was less than the DCGL_w. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the DCGL_w.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of samples with the ACTUAL survey unit standard deviation.

The actual total surface contamination standard deviations for Unit C are: α 28.7 $^{*}\beta$ 215

Thus, the ACTUAL required number of samples is as follows:

 $\Delta/\delta = (DCGL_{TSA} - LBGR_{TSA})/SD_{TSA}$

,

 $\Delta/\delta_{\text{transuranics}} = (100 \text{ dpm}/100 \text{cm}^2 - 50 \text{ dpm}/100 \text{cm}^2)/\frac{28.7}{28.7} \text{ dpm}/100 \text{cm}^2 = \frac{1.74}{28.7}$

 β $\Delta/\delta_{transuranics} = (5000 \text{ dpm}/100 \text{cm}^2 - 2500 \text{ dpm}/100 \text{cm}^2)/ 215 \text{ dpm}/100 \text{cm}^2 = 11.6$

Where:

 Δ/δ is the relative shift or the resolution of measurements in units of measurement

uncertainty

DCGL TSA is the total surface Activity derived concentration guideline value (DOE Order 5400.5 total surface

Activity limit equals 100 dpm/100cm² for transuranics and 5000 dpm/100cm² for uranium, per the

T112A-C Pre Demolition Survey Plan)

LBGR TSA is the lower bound of the gray region – the lower bound of the range of values of the parameter of

interest in a survey unit where the consequences of making a decision error is relatively minor (set equal

to the value utilized in the original sample size calculation).

SD_{TSA} is the ACTUAL standard deviation of the total surface Activity

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (Actual value approaches one. The highest published value is utilized for conservatism).

Survey Area:	T112	Building:	T112C
Survey Unit:	C (T112C Exterior)		

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of TSA surface Activity measurements for the applicable survey unit using the following

MARSSIM, Section 5.5.2.3 formula that is based on Plutonium contaminants not being present in the background:

 α and β

 $N = (1.645 + 1.645)^2 / 4(Sign P - 0.5)^2$

 $N = (1.645 + 1.645)^2 / 4(0.998650 - 0.5)^2 = 10.9$

Where:

1.646

is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition

Survey Plan

Sign P

equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

N = 10.9 * 1.2 = 13

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 Total Surface Activity measurements were required in Unit C.

Step 4:

Draw conclusions from the data: All measurements are less than DCGLw. The minimum number of required TSA

measurements were collected. Thus, survey Unit C complies with the TSA release criteria.

D. A. BARNES	Ab-	8-19-99
Prepared By: Printed Name	Radjølogical Engineer Signature	Date
ESMASNOUCS	Mostabali	8/19/89
Reviewed By: Printed Name	Radiological Engineer Signature	Date

Building T112C Floorplan

Room 2	Room 3 Room 4 Room 5	Room 7 Room 6
İ	Room 2	

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Electra Performance Test Log Beta 33.5% . 22.3% Instrument Serial Number Instrument Efficiency Alpha 827 Instrument Calibration Due Date Source Acceptable Range (sq) Source Acct. (cpm) Source Serial Number Calibration Due Date Source Act. (dpm) 4430 to 6645 5537 -603 680141d 24830 22723 6090 10 to to to to to RCT NAME RCT Signature ALPHA Reading **ALPHA** BETA BETA Reading BETA RCT Employee ALPHA Date Pass/Fail Bkgd 3 (Corrected Pass/Fail Number (Print) BKGD3 (Corrected cpm)3 cpm)3 PUSS Pass 572580 Wows 7066 5710 813 199 PUSI 539 Pass 5040 512540 Monoz. 7040 478 Snoe 1455 1455 57256 Mroz 815199 4860 180 8 16 199 7149. les levust 511466 PASS 3 PASS 817 199 539 7353 516740 5146 6723 8110199 5091 PASS 606 PASS 516740 597 5040 7A53 6792 PASS 516740 8111199 5010 556 7047 8795 514740 8112189 7000 658 7120 516740 PASS 5070 Pars 8113199

1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

REVIEWED BY: ____

O SUPERVISOR PRINT NAME

2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).

RO SUPERVISOR SIGNATURE

DATE

3. All counts are to be 1 minute in duration.

NOTE If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER P	ERFORMANCE LOG
	ALPHA BETAR
INSTURMENT MODEL: (Circle One)	
- Coc / hint tim 7979 · Counter Serial No.	Building: 549 Location: office
SAC- 1 BC- 1 2 199 End Date: 8 8 99	Conflication Due Date: WLA
3000 0000 2777	Continential of Continential o
Const Source com:	Rtr. cpm:
Shill All Ober span:	RCT Emp Net Source cpm:
RCT Emp. 5 No. 500 receptor	%Error:
7.0101	Prior Name / Signature
(Print Name / Signature) Gross Source opm: 5405	Shill MS Press Sparce cpm:
Shift O1	. Time: ver Source com:
RCT Emp. " Nel Source chai: 5368	RCT Emp. 8 %Error.
m 1102 /1 7.600.	(Print Name / Signature)
(Print Name/Signature)	Shift DS ONDO Bre com: 43
Shift PI Gross Source epa:	time: 55/2
Time:	RCT Emp. "- ". Error: -3,0
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Time:	KCI Emp. "Kerror:
RCT Emp. " Net Source com: "Error:	(Print, Name / Signature)
(Print Name / Signature)	Cross Source com:
if D2 Cross Source cpm:	Time:
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(Print Name / Signature)	Shift P6 Cross Sparce cpm:
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Time: Net Source opm:	RCT Emp. #
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- Cincipal Construct	(Print Name / Signature) Gross Source cpm:
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Milas	(Print Name / Signature) Cross Source Cpm:
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Time: Bke.cpm:	RCT Emp. F Net Source cpm:
RCT Emp. 5 Net Source cpm:	%.Error:
%Error:	(Stint Name / Signature) Cross Source cpm:
(Print Name : Signature) Shift M4: Gross Soft expm:	- Sant 1 · · · · · · · · · · · · · · · · · ·
1 1860 Chui	- Time:
RCT Fmo F Net Source cpm:	RCT Emp. #
%Error:	(Print Name / Signature)
(Print Name 7 Signature) Gross Source opm: 5324	% ERROR= (Net cpm/E)-Source dpm x 100
ili 04 Bre com: 41	- % ERROR= (Ter Chime) - 300
Net Source com: 5283	_ Source dpm
Maria 16 1. Eccor: -7.0	Nct cpm = gross - background cpm
in the Construct Construct	1.
E = Efficiency=01) for the SAC-1 and 0.25 for the BC-1	8-10-99
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Approved by :	Cianalisa Date
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ROCKY FLÄTSENVIRÖNMENTAL TECHNOLOGY SITE

SWIPE COUNTER P	EKLOKWYIACE FOO
	ALPHA BETA G
INSTURMENT MODEL: (Circle One)	RC 905 Calibration Due Date: 9-30-99
SAC-(IBC-4/LUDLUM 2929 · Counter Serial No.:	
SAC-TIBLATION SOLVER Ford Date: 9-8-99	Dullotti,
Start Date: 8-2-99 End Date: 8-8-99	0 - 5 - 0 - 0 - 0 - 1 - 1 - 4
Source: SN 603927 D. P. M.: 2272	Source com.
Cross Source cpm:	Bire com:
// Cipte com:	RCT Emp. # Net Source cpm:
OCT From ! New Source Com:	%Error:
%Error.	(Print Name / Signature)
(Print Name / Signature) Gross Source cpm: 5097	Shift MS Company Com:
Shift DI	Time:
Time: 0 600 Big-cpm: 715 505 505	RCT Emp. 5 Yet Source com:
RCT 2m/s	
(Priat Name / Seasture)	(Print Name / Signature) Gross Source cpm: 50 28
C Sames cont	Shift DS ASTO
Shill I.T. Blis com.	N. Saussesom: 44 X
RCT Emp. # Net Source cpm:	RCT Emp. " Jab Ikn "Error: -12,2
KCI Emp "Error:	(Print Name / Signature)
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Shift M2 . Cross source com:	Timb: Btg. cpm:
Time: Big. com:	RCT Emp. " Net Source com:
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if D2	Time Bit com:
Mct Source cpm: 4976	RCT Emp. # %croc:
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Carra Commo combon	_ Sunt DV
Shill P2 Time: Bkg. cpm:	11mc Source com:
RCT Emp. F Net Source cpm:	RCT Emp. = Kasoure com.
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Shill MJ Cross Douce com:	- Rkg. cpm:
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	(Print Name / Signature)
(Print Name / Signature) Cross Source cpm: 5114	Shift M7 Cross Source cpm:
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M. V. Error: -10.6	
(Print Name / Signature)	(Print Name / Signature) Cross Source Cpm:
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RCT Emp. c Nci Source cpm:	- Kercor:
1 % Error:	(Spint Name / Signature)
(Print Name : Signature)	Shift P7 Cross Source cpm:
Shill M4 Cross Sourcesm:	Time:
Time: Bue com:	RCT'Emp. # Net Source cpm:
RCT Emp. # Net Source cpm: %Error:	%Error:
	(Print Name / Signature)
(Print Name / Signature) if D4 Gross Source cpm: 5092	(Not comff) Source dom = 100
Bkg.cpm: 41	% ERROR= (Net cpm/E)-Source dpm x 100
BUBS	Source dpm
2.6	Net cpm = gross · background cpm
(Prior Name / Signature)	techin - from a grant
E - Efficiency=011 for the SAC-1 and 0.25 for the BC-1	. 0 1
C Comment of the comm	8-10-
/ NIC TROOP	// 100 ple /
Approved by :	Ciantura Date

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ROCKY FLATSENVIRONWENTAL TECHNOLOGY SITE

SWIPE COUNTER	PERFORMANCE LOC :
	ALPHA BETAIL
INSTURMENT MODEL: (Circle One)	•
1/ Counter Carol NO	Ruilding: 549 Location: o-F-G-Ce
11 -6 U - 7 - 7 U F NO 1/2(C, 72°() 1 (
Source: SAN 6:30141 D. P. M.: 24	
Source Com:	Shift P4 Cross Source cpm: Big. cpm:
Shift MI Time: Other cpm:	1 time:
act Emp. 9 Not Source War	RCY Emp. s
7. Error:	(Print Name / Secontary)
(Print Name / Signature) Gross Source opm: 7377.	Shill MS Const Source cpa:
Shill Di	. Time: 8ke. cpm: Yet Source cpm:
Time: C (co) RCT Emp. Net Source cpm: 7372	RCT Emp. 4 Source com:
mynoz m %iror -10.0	(Print News / Signature)
(Priat Name / Signature)	Spilt DS Gross Source cha:
Shift PI Gross Source cpm:	Time: \ Bkg.cpm:
Time:	RCT Emp. * Net Source cpm:
RCT Emp. " Net Source com: " " Error:	%Error:
(Print Name / Signature)	(Print Name / Signature) Gross Source cpm:
Shift M2 Gross Source char:	- Sudit S
Time:	RCT Emp. 6 Net Source cpm:
RCT Emp. # Net Source cpm:	*Error:
%£(roc	(Print Name / Signature)
(Priat Name / Signature) Gross Source cpm: 71 73	Shin M6 Cross Source char:
atta com:	Time Bie cpm: Accident comments of the commen
CT Emp. " Nei Source cpm: 7193	RCT Emp. s
M. 5402 Ple 9 "Error -12.2."	(Print Name / Separture)
(Print Name / Signature).	Spill D6 Cross Source chm:
Shill P2 Cross Source cpar	Time: \ Bkc.cpm:
Time: Bkg. cpm: Not Source cpm:	RCT Emp. = Net Source cpm:
RCT Emp. F Net Source com:	\%Error
(Print Name / Signature)	(Print Name / Signature) Chie Pé Gross Source com:
Shill MD Chis Souce com:	8kg\cpm:
Time: Bkg.cpm:	RCT Fma F Not Source chair
RCT Emp. # Net Source epm:	%Error:
(Print Name / Signature)	(Priat Name / Signature)
Shift D3 Cross Source cpm: 7224	Shift M17 Cross Source cpm:\ Bkc.cpm:\
Time: 0600 Bkg. cpm: 0.0	(imc
RCT Emp. # Nct Source cpm: 12.2.	RCT Emp. F Nct Source cpm: Y.Error:
My1107 M - 4 "XError: -11.8	(Print Name / Signature)
(Print Name / Signature) Chile Plan Cross Source opm:	Shift D7 Cross Source cpm:
Shin 13	Time: Bug. cpm:
RCT Emp. " Ngs Source com:	RCT Emp. F Nct Source com: %Error:
%Error:	(Spint Name / Signature)
(Print Name : Signature)	Shift P7 Gross Source cpm:
Shill M4. Gross Source cpm.	Time:
Time: By: cpm:	RCT Emp. 5 Net Source cpm:
RCT Emp. # Nct Source cpm: %Error:	%Eccoc:
(Print Name / Signature)	(Print Name / Signature)
ift D4 Gross Source cpm: 7290	% ERROR= (Net cpm/E)-Source dpm x 100
mc: 5/200 8kg.cpm: 0.1	_ % ERROR= (INCOMPANIE)
TEmp. # Net Source cpm: 1270	Source dpm
Marin "[1.0	Net cpm = gross - background cpm
(Print Name / Signature)	
E = Efficiency=0.1) for the SAC4 and 0.25 for the BC4	U1) 4/10 9/10
Approved by: (NCooper 1	Moore 8-10-10
Approved by : (N Cooper 1	Date

ROCKY FLATSENVIRONMENTAL TECHNOLOGY SITE

2MILE COOKLEK L	
(Ci-le O-e)	ALPHA BETAIN
INSTURMENT MODEL: (Circle One)	
SAC I BC-4 / LUDLUM 2929 Counter Serial No.	Building: 549 Location: Office
Start Date: 8-9-99 End Date: 6-15-99	Building Our Date:
Source: SN 680141 D. P. M .: 2483	
Shift MI Gross Source com:	Otra com:
Bkr. com:	(time
RCT Emp. # Net Source cpm:	RCT Emp. # Net Source cpm:
%Error:	(Print Name / Signature)
(Print Name / Signature) Gross Source opm: 7540	Shili MS Comes Source opan:
Samo	Time: Big.cpm:
1100	RCT Emp. #
	%Error:
(Print News/ Signature)	(Print Name / Segusture)
Shift P1 Gross Source cpm:	Shift DS Cross Source cpm: 1631
Time: Btg.cpm:	11 C 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
RCT Emp. # Net Source cpm:	
%Error:	(Print Name / Signification
(Print Name / Signature)	(Frint: Start -
Shift M2 . Gross Source cpm:	Shift S Cross Source chair
Time:Bt_z.cpm:	RCT Emp. 6 Net Source cpm:
RCT Emp. F Net Source cpm:	%Eccoc:
	(Print Name / Signature)
(Print Name / Signature) (Print Name / Signature) (Print Name / Signature)	Shirt M6 Gross Source cpas:
OLDO Riccom: 0.7	Time Btc cpm:
AC: 0630 Bic cpm: 0.3	RCT Emp. # Net Source cpm:
BASSWEATHD / STANDERSOND "Error -11.6.	7.Error
(Print Name ASt nature)	(Print Name / Signature)
Shill P2 Gross Source cpant	Shift D6 Gross Source cpm:
Time: Bkg.cpm:	time.
RCT Emp. F Net Source cpm:	RCT Emp. =
%Error:	(Print Name / Signature)
(Print Name / Signature)	Shift P6 Cross Source cpm:
Shift MJ Gross Source cpm:	Time Bkg.qpm:
Time: Bkg.cpm:	RCT Ema. F. Not Source com:
RCT Emp. # Net Source epm: " %Error: "	%£\(\tau_0\);
(Print Name / Signature)	(Priat Name / Signature)
Shift D3 Cross Source cpm: 7437	Shift M7 Cross Source cpm:
7 0630 Bkr.com: 01	Time: Btg.cpm:
Net Source cpm: 7427	RCT Emp. F Net Source cpm:
CHASEUX Sentramp. Error - 912	(Print Name / Signature)
(11111)	1
Shift P3 Gross Source cpm:	Shift D7 Cross Source Cpm:
Time: Bkc. cpm:	Yet Course com:
RCT Emp. c Net Source cpm:	RCT Emp. 2 %Error:
%Error:	(Spint Name / Signature)
(Print Name : Signature)	Shift P7 Cross Source cpm: .
Shift M4.) Cross Source com: Time: B4g. com:	Time:
RCT Emp. # Net Source cpm:	RCT Emp. # Net Source cpm:
%Error:	7. Erroi:
(Print Name / Signature)	(Print Name / Signature)
Gross Source com: 7706	(Not som/E) Source dom = 100
1c: 0620 Bkg.cpm: 0.3	% ERROR= (Net cpm/E)-Source dpm x 100
TEmp # ANCE Squeece cpm: / (UT)	Source dpm
Winkano/ Showest from -5,9	Net cpm = gross - background cpm
(Print Name (Signature)	incom - Gran accepti
E = Efficiency=01) for the SAC-1 and 025 for the BC-1	•

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Mfg.		Mfg	Eberline	Mfg.			:	•	Surv	ey Ty	pe <u>CO</u>	NTAM	UNATIO	<u>n su</u>	RVE	<u>Y</u>	
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Seria		Serial#_				7,		1 .		tion:_			30 Yard				
Cal I	Due 10/26/99	Cal Due	10/13/99	Cal Du	e	N	<u>'A</u>	:	Purp	ose:	Resurvey	per R.I	E. (MAR	SSIM	Surv	<u>/ey)</u>	
Bkg.		Bkg						•									
H	ency <u>33 %</u>	-			-		7	; ;	RWI	'#: _			N/A				
MD	4 6.5 dpm	MDA_	7.5 dpm	MDA _			/	:	ĺ			•					
								1	Date	: _	08-19-99		Time:		11:00	<u> </u>	
Mfg.	Eberline	Mfg	Eberline	Mfg	<i>:</i>		ech										
Mod						Ele			RCT	<u>:</u>	Hersey	_/_					
Seria		-	770					:			Print name		Signat	ure			P
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Bkg.		Bkg							RCT	<u>:</u>	N/A		Cirri			<u> </u>	
li	ency <u>25 %</u>										Print name		Signat			Emp	p. #
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lSwipe #		ation/Descr alts in DPM/10		-		_	Alpha		41 7 1		Results in DPA	жирион и/100СМ ²))			Alpha	
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	T112B ROOF					-44 -28	151	141	QA QA					1	XA	129	118
	T112A ROOF				.0.		- 58	26	1					1	\mathcal{T}	44	-13
	T112A ROOF				0.6	16	27	0	QA	#6		-		╁		62	95
	T112A ROOF		··· ·		1.5	-44	53	-43		<u> </u>				+-		\vdash	
6	T112A ROOF	A6		- 10	.0.	20	76	-69	} ——	/ -				+			
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2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be I minute in duration.

NOTE

If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

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### ~ROCKYFISTSENVTRÖNNENTAGTEGHNOLOGY SITE

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Rev. 05/98

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2	TI12A ROOM 6 FLOOR A1*	<6.5	<200	1_		22	
3	T112A ROOM 8 WALL P2+	<6.5	<200.	<u> </u>		23	
4	T112A ROOM 9 FLOOR A3*	<6.5	<200.	1_	<u> </u>	24 i	
5	TI 12A ROOM II WALL KI*	<6.5	<200			25	
6	T112A EXTERIOR WEST WALL BI*	<6.5	<200			26	
7	TI 12A EXTERIOR NORTH WALL A1*	<6:5	<200	$\perp$	<u> </u>	27	
8	T112A EXTERIOR EAST WALL K3*	<6.5	<b>⊘</b> 200:		ļ., <u> </u>	. 28	
9	T112A EXTERIOR SOUTH WALL E3*	<6:5	<200			29	
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14	T112B EXTERIOR NORTH WALL L1*	<6.5	<200		$\prod$	34	
15	T112B EXTERIOR ROOF F1*	<6.5	<200			35	A: Yelenson
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18	TI12C ROOM 5 WALL HI*	<6.5	<200		11	38	
19	T112C ROOM 6 FLOOR C1*	<6.5	<200		1 1	39	
20	TI12C EXTERIOR ROOF M3*	<6.5	<200			40	
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3. All counts are to be 1 minute in duration.

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Survey Area: T112	Survey Unit: Unit C	Building: T112C
Survey Unit Description	n: Office trailer – Pre Dem	olition Survey

Building Information		
Classification: Type 1 🗵 Type 2 🗖 T	ype 3 🔲	
, , , , , , , , , , , , , , , , , , ,	<b>,</b> '	
Contaminants of Concern: Plutonium	Uranium 🗵 Other 🗆	
Special Support Requirement		
Survey points randomly generated by Ra	diological Engineering	
<b>Special Safety Precautions</b>		
	tion Monitoring Requirements" and IWCP	
Labeling Requirements	:	
Not Applicable		:
Suntan Dankana Implaman	4-4:	
Survey Package Implement	tation	
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This survey package is ready for implem		3 20
D. A. BARNET	SHI	8-3-99
Radiological Engineer Printed Name	Radiological Engineer Signature	Date
H.B. ESTABROOKS	d Statuli	8/3/99
RE Peer Review Printed Name	RE Peer Review Signature	Date
Survey Package Closure		
	ata analysis results meet RLCP criteria. Survey pa	ackage is
authorized for closure.		
T. A. BAZINES		8-19-99
Radiological Engineer Printed Name	Radiological Engineer Signature	Date
ESMBNOOKS	All Walley As	8/19/95
RE Manager Printed Name	RE Manager Signature	Date

Survey Area: T112 Survey Unit: Unit C Building: T1
Survey Unit Description: Office trailer – Pre Demolition Survey Building: T112C

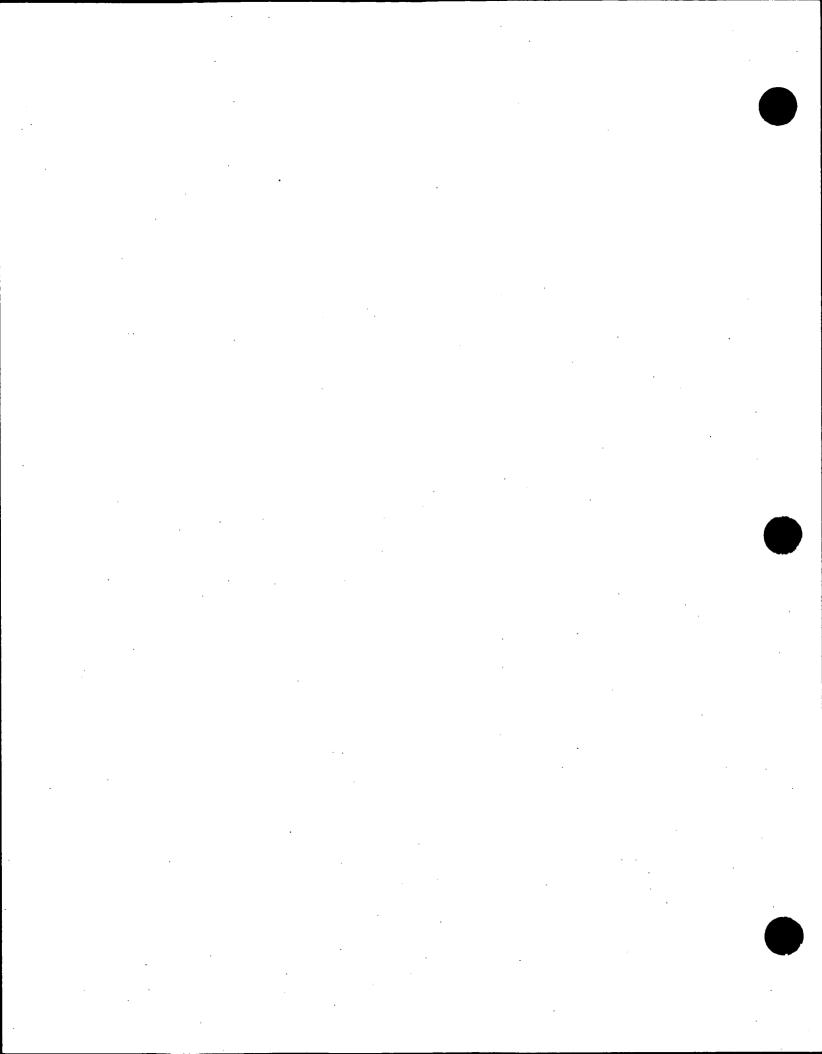
Measurement	Amount & Type	Comments
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP
		The RCT will document the readings of all surveys performed.
	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m ² scan surveys will be performed at locations indicated.
		Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
•	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None

Building T112C Floorplan

····	ω
Room 5	Воот 6
Room 4	
Room 3	Room 7
Room 2	
Room 1	

 ~ ~	 •

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#### Appendix 5

RFETS Radiological and Non-Radiological Trailer 112 A-C Characterization Package



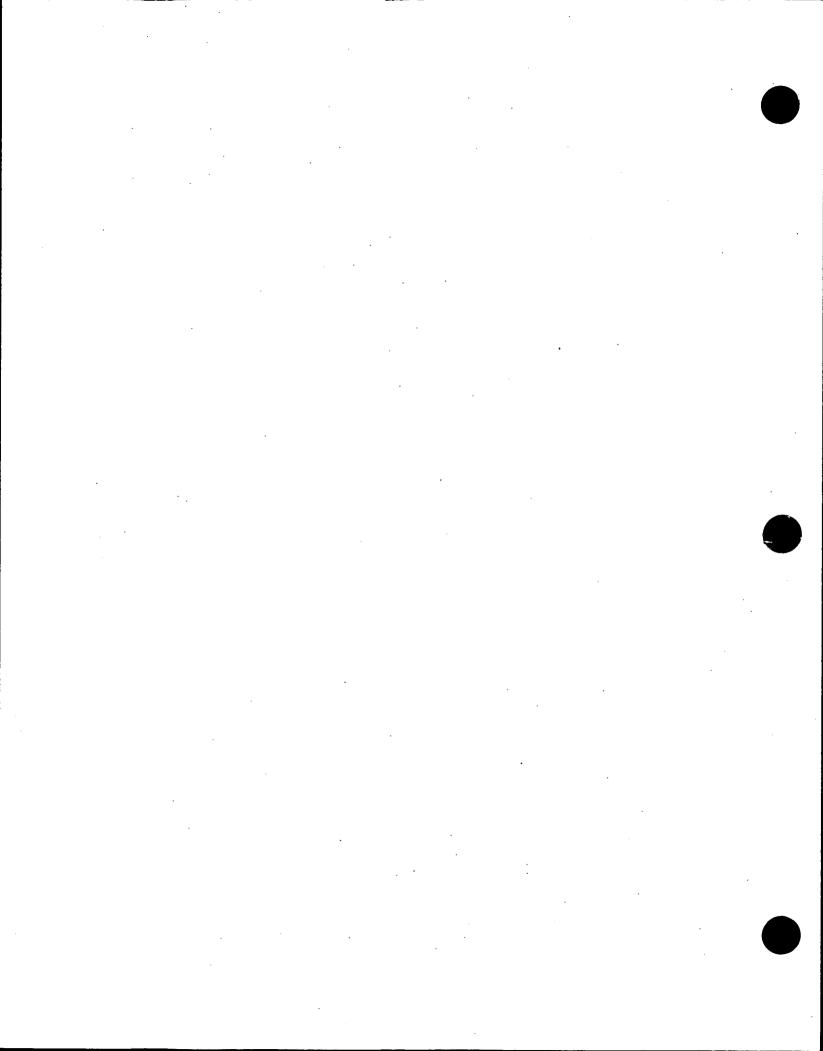


### **Rocky Flats Environmental Technology Site**

#### Radiological and Non-Radiological Characterization Package for Trailers 112A, B, and C

**July 1999** 

	•
Revision 0	
Makayussara	8/4/99
Marla Broussard	Date
RMRS Responsible Manager	
As N. Slone	8/4/99
Jim-Moore	Date /
RMRS Quality Assurance	
Approved by:	8/1/95
Jeff Stevens	Date
Manager, D&D Advanced Planning	•
Kaisey-Hill Company	



# Table of Contents for Characterization Package for

# Trailers T112A, T112B, and T112C

1.0	Introduction	2
2.0	Characterization Instruction for Radiological Surveys	
	Package A	3
	Package B	9
	Package C	13
	Package D	17
3.0	Characterization Instruction for Non-Radiological Sampling	20

8/4/99

#### 1.0 INTRODUCTION

PRE-DEMOLITION

This Characterization Instruction is designed to describe the necessary surveys and sampling for characterization and final status survey of RFETS Trailers T112A, B, and C in preparation for release to commerce.

Page 2 of 23

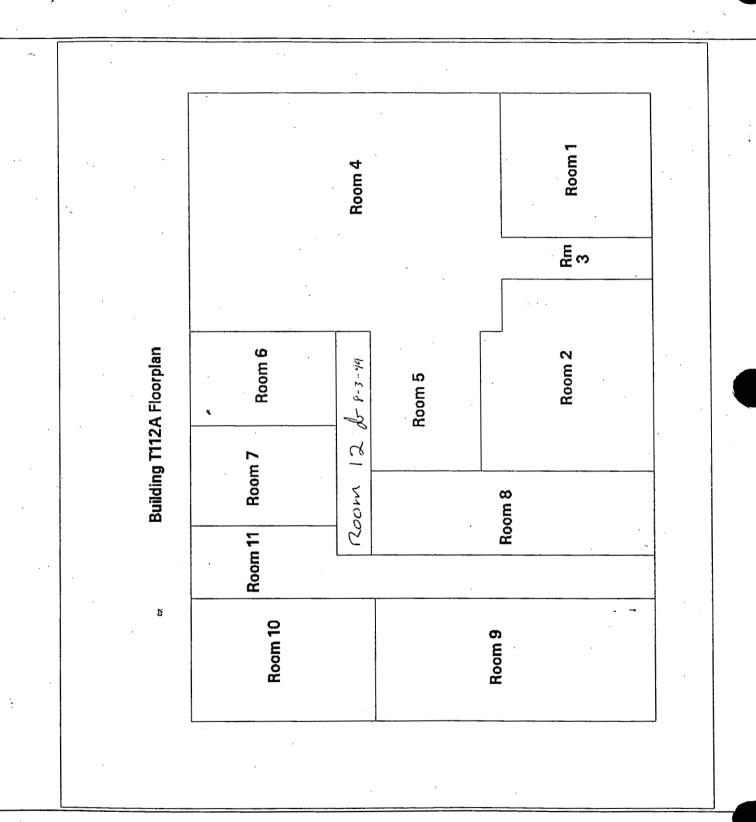
# 2.0 CHARACTERIZATION INSTRUCTION FOR RADIOLOGICAL SURVEYS

Survey	Area:	T112	Survey Uni	t: Unit	Α	Building: T112A	
Survey	Unit D	escriptio	n: Office trail	er – Pre	e Dem	olition Survey	

Building Information			·
Classification: Type 1 🗵 Type 2 🗖	Туре 3 🔲	•	
		<u></u>	
Contaminants of Concern: Plutonium	✓ Uranium	X Other	
Special Support Requirem			
Survey points randomly generated by F	Radiological E	Engineering	
<b>Special Safety Precaution</b>	S		
Per 3-PRO-165-RSP-07.02, "Contamin		ring Requirements" and IWCP	
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Labeling Requirements  Not Applicable		•	
Not Applicable		•	
Survey Package Implemen	ntation		
This survey package is ready for imple	mentation.		
D. A. BARNES		Ess.	8-3-99
Radiological Engineer Printed Name	1	Radiological Engineer Signature	Date
H.B.ESTABROOKS		Martebain	8/3/98
RE Peer Review Printed Name	Z Z	RE Peer Review Signature	Date
Survey Package Closure			
		•	
All required reviews are complete, and authorized for closure.	data analysis	s results meet RLCP criteria. Survey pa	ackage is
Radiological Engineer Printed Name	Employee #	Radiological Engineer Signature	Date
Nationogical Engineer Printed Name	ыпрюуее #	Natiological Engliseer Signature	Date
RE Manager Printed Name	Employee #	RE Manager Signature	Date

Survey Area: T112 Survey Unit: Unit A Building: T112A
Survey Unit Description: Office trailer – Pre Demolition Survey

Measurement	Amount & Type	Comments
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP
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	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m ² scan surveys will be performed at locations indicated.
		Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None



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Survey Area: T112	Survey Unit: Unit B	Building: T112B
Survey Unit Description	n: Office trailer – Pre Dem	olition Survey

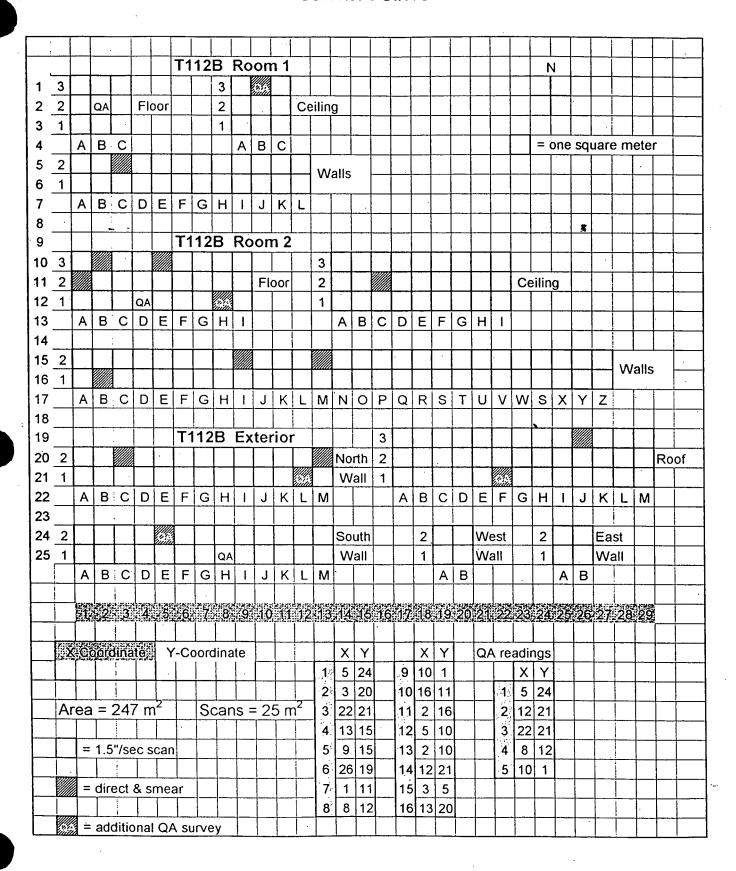
Building Information			
Classification: Type 1 X Type 2	Type 3 🔲		•
Contaminants of Concern: Plutonium	X Uranium	X Other 🔲	· 
Special Support Requiren	nents		
Survey points randomly generated by	Radiological E	ngineering	*
Special Safety Precaution	18		
Per 3-PRO-165-RSP-07.02, "Contamin		ing Requirements" and IWCP	
Labeling Requirements	· · · · · · · · · · · · · · · · · · ·		
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Survey Package Impleme	ntation		
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This survey package is ready for imple	ementation.		
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Radiological Engineer Printed Name		Radiological Engineer Signature	Date
H. B. ISSTABROOKS RE Peer Review Printed Name		Modelatule	8/3/99
RE Peer Review Printed Name	, , , , , , , , , , , , , , , , , , ,	RE Peer Review Signature	Date
Survey Package Closure			
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All required reviews are complete, and	t data analysis	results meet RLCP criteria. Survey	nackage is
authorized for closure.	a data anaiysis	results these reports of tone. Survey	
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Padiological Engineer Orieted Name	Empleyes #	Redictorion Engineer Clanch	Pote
Radiological Engineer Printed Name	Employee #	Radiological Engineer Signature	Date
RE Manager Printed Name	Employee #	RE Manager Signature	. Date

Survey Area: T112 Survey Unit: Unit B Building: T112B
Survey Unit Description: Office trailer — Pre Demolition Survey

Measurement	Amount & Type	Comments
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP
		The RCT will document the readings of all surveys performed.
	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m ² scan surveys will be performed at locations indicated.
		Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None

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	Building T112B Floorplan		
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#### 112 Trailers PDS Unit B - T112B SURVEY POINTS





Survey Area:	T112	<b>Survey Unit:</b>	Unit C	Building:	T112C
Survey Unit Do	escription	n: Office trailer	- Pre Dem	olition Surv	ey

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	RE Peer Review Signature	Date
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Employee #	Radiological Engineer Signature	<u>Date</u>
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Employee #	RE Manager Signature	Date
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Survey Area: T112 Survey Unit: Unit C Building: T112C
Survey Unit Description: Office trailer – Pre Demolition Survey

Measurement	Amount & Type	Comments
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP  The RCT will document the readings of all surveys performed.
	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m ² scan surveys will be performed at locations indicated.
		Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None

Building T112C Floorplan

Room 3

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Survey Area: T112	Survey Unit:	Unit D	Building: T112A						
Survey Unit Description: Office trailer – Pre Demolition Survey									

Building Information									
Classification: Type 1 🗵 Type 2 🗖 Type 3 🗖									
Contaminants of Concern: Plutonium 🗵 Uranium 🗵 Other 🔲									
Special Support Requirements									
Survey points randomly generated by F	Survey points randomly generated by Radiological Engineering								
Special Safety Precaution			· · · · · · · · · · · · · · · · · · ·						
Per 3-PRO-165-RSP-07.02, "Contamin		ing Requirements" and IWCP							
Lobeline Developer									
Labeling Requirements  Not Applicable		•	·						
1 Not Applicable									
Survey Package Implemen	ntation								
•									
This survey package is ready for imple	mentation	· · · · · · · · · · · · · · · · · · ·							
D. A. BARNES		Ihr-	8-3-99						
Radiological Engineer Printed Name		Radiological Engineer Signature	Date						
H.B.ESTABROVICS		Mostlabaly	8/3/99						
RE Peer Review Printed Name		RE Peer Review Signature	Date						
Survey Package Closure		•							
All required reviews are complete, and authorized for closure.	data analysis	s results meet RLCP criteria. Survey pa	ackage is						
		,							
Radiological Engineer Printed Name	Employee #	Radiological Engineer Signature	Date						
		·							
RE Manager Printed Name	Employee #	RE Manager Signature	Date						

Survey Area: T112 Survey Unit: Unit D Building: T112A
Survey Unit Description: Office trailer – Pre Demolition Survey

Measurement	Amount & Type	Comments
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP  The RCT will document the readings of all surveys
	5 duplicate survey points for QA purposes.	performed.  QA survey points done by different RCT  Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m ² scan surveys will be performed at locations indicated.
		Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
·.	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None

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# 3.0 CHARACTERIZATION INSTRUCTION FOR NON-RADIOLOGICAL SAMPLING

Page <u>20</u> of <u>23</u>

# NON-RADIOLOGICAL CHARACTERIZATION PACKAGE COVER SHEET

Building Information		•		
Classification: Type 1 X Type 2 1	Туре 3 🔲			:
Contaminants of Concern: Plutonium	🛚 Uranium 🖾	Other $oxtimes$ RCRA Co	nstiti	uents,
Lead, Beryllium, PCBs, A	Asbestos			
Special Support Requirem	ents			
None.				
			<u>*</u>	
Special Safety Precautions	S			
None.				
Labeling Requirements				
None.	:	· ·		
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Characterization Instruction	on Implemen	ntation		
This survey package is ready for implem	entation. Adequat	e detail is provided satisfy I	QO's.	These DQO's and
data evaluation requirements are covere	d in the Decontam	ination and Decommissionin	ig Chara	cterization Protocol,
MAN-077-DDCP.		1		
Paul A. Wojtaszek		ald Will	4.	08/04/19
Preparer Printed Name		Preparer Signature	· · · · · ·	Date
Jim Moore	1	a H. bloom		8/4/99
Reviewer Printed Name	1	Reviewer Signature		Date

#### **SAMPLING AND SURVEY INSTRUCTIONS**

Sampling Requirements: No sampling for non-radiological contaminants is required for this characterization. All characterization for non-radiological contaminants will be done using historical data.

data.  Measurement	Amount & Type	Comments
RCRA constituents	None	According to historical data and process knowledge, no chemicals were used or stored in any of the three trailers (D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report). Therefore, sampling for chemical contaminants is unnecessary and will not be conducted.
Lead (Pb) in paint	None	Wooden stairs and platforms have been attached to the trailers and are coated with paint which has not been characterized for Pb content. These stairs and platforms will be disposed of as waste. However, Environmental Waste Compliance Guidance #27, Leadbased Paint (LBP) and Lead-based paint Debris Disposal, has directed that LBP debris generated outside of currently identified HCA's shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal. Therefore, analysis of Pb in paint from wooden stairs and platforms is unnecessary and will not be conducted.  The paint on the interior and exterior surfaces of the trailers has not
		been characterized for Pb in paint. Such characterization is not required for release of the trailers to commerce. Therefore, analysis of Pb in paint from the interior and exterior surfaces of the trailers is unnecessary and will not be conducted.
Beryllium	None	There is no record of beryllium operations or storage being carried out in any of the three trailers (D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRRManager's Report, and List of Known Beryllum Areas).  Additionally, these trailers have been used as administrative office space since their arrival on site, and the RFETS Administrative Equipment Characterization for Beryllium Contamination Project Plan Report showed no detectable beryllium contamination in the 60 RFETS buildings with no record of beryllium activities that were studied.
		However, since T112 A, B, and C were not included in that study,

·		the CBDPP conducted an independent beryllium survey of T112A, which confirmed absence of detectable beryllium contamination. The results of this survey will be included in the T112 RLCR.
		No additional beryllium sampling will be conducted as part of this characterization package.
Polychlorinated	None	A high voltage electrical power transformer is mounted on a
biphenyls (PCBs)		concrete pad outside the southwest corner of T112A, and is labelled.
·		"No PCBs." There is no record of PCB use or storage in any of the trailers (D&D Facility Characterization Interview Checklist and
		Attached Facility Checklist and HRR Manager's Report).
<b>.</b> .		Therefore, analysis for PCBs within the trailers is unnecessary and will not be conducted.
:		
	'	Wooden stairs and platforms have been attached to the trailers and are coated with paint which has not been characterized for PCB content. These stairs and platforms will be disposed of as waste. However, Environmental Waste Compliance Guidance #25,
		Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition, has
		directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification)
		in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761.3 and 40 CFR 761.62 paragraph (b) and therefore need not be sampled as long as restrictions outlined in 40
		CFR 761.62 regarding their disposal are met.
		Additionally, while the paint on the interior and exterior surfaces of the trailers has not been characterized for PCBs in paint, such
		characterization is not required for release of the trailers to
	. •	commerce. Therefore, analysis of PCBs in paint from the interior and exterior surfaces of the trailers is unnecessary and will not be conducted.
		win not be conducted.
Asbestos	None	Historical asbestos inspection data exist for T112 A,B, and C.
		Thirteen samples of floor tile, wall, and ceiling material were taken in T112A, and of these, 4 floor tile samples were determined to be
		asbestos-containing. Six samples of floor tile, wall, and ceiling material were taken in T112B, and of these, 1 floor tile sample was
		determined to be asbestos-containing. Nine samples of floor tile, wall, and ceiling material were taken in T112C, and no asbestos
		was detected. For release to commerce, this information must be disclosed, but further characterization is unnecessary. Therefore, no
		further asbestos inspection or sampling will be conducted.
	<u> </u>	<u></u>

#### Appendix 6

Final Sampling: Analysis Plan For Roofing Material from Trailers T112A and T112B for Isotopic Analysis, (RF/RMRS-99-332)



Final Sampling and Analysis Plan for Roofing Material from Trailers T112A and T112B for Isotopie Analysis

RF/RMRS-99-332





July 21, 1999

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CONTROLLED DOCUMENT
ROCKY FLATS PLANT
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COPY HOLDER NO.

#### Administrative Information

Site:

Rocky Flats Environmental Technology Site

Golden, Colorado

**Project Name:** 

Sampling of Roofing Material From Trailers T112A and T112B

for Isotopic Analysis

Date Prepared:

July 20, 1999

Date Effective:

July 21, 1999

#### **Approvals**

I have read and approved this sampling and analysis plan with respect to the objectives of the project.

Paul A. Wojtaszek

Project Manager, Document Co-Author

Hopi Salomon

Document Peer Review

Dave Barnes

Radiological Engineer, Document Co-Author

Greg DiGregorio

**RMRS Quality Assurance** 

Marla Broussard

Manager, Characterization

#### 1.0 INTRODUCTION

Trailer T112A was assembled at Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112, in the early 1960's. The size of the T112A is approximately 45' X 60' and it is assembled from 5 trailer units of approximately 12' X 45' in size. The siding and the skirting (which is approximately 28" high) consists of enamel on aluminum. The trailer is structurally sound. The foundation is concrete blocks and the tie down method for the unit is steel cable from the trailer's I-beam secured to concrete caissons. T112A is unoccupied at the present time, but has previously served as office space for a travel office, transportation security scheduling office, and company store.

Trailer T112B was moved to Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112 in 1990 or 1991 from the Bldg. 771 trailer park. At this time the interior was refurbished. T112B has a nearly full length wooden deck with a sloped roof on its south side. The siding and the skirting consists of enamel on aluminum. It has served as a site for folding laundry, telecommunications office space, and storage of telecommunications equipment. It is presently unoccupied. The tiedown method is unclear due to the intact skirting.

Trailer T112C was put in place at Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112 in 1991. The entryways are covered by wooden panels. The siding and the skirting consists of enamel on aluminum. It has served as office space for the Wackenhut scheduling office. It is presently unoccupied. The tiedown method is unclear due to the intact skirting.

Asbestos characterization data exist for the interior of both trailers, and show asbestos in the floor tile mastic. Hazardous chemicals were not known to be used or stored in these trailers. The tailers have not been characterized for use of lead-based paint.

The purpose of this Sampling and Analysis Plan (SAP) is to collect data to satisfy data gaps regarding radiological contamination of the roofing material of T112A and T112B.

Due to past RFETS experience with the unrestricted release of similar structures it is considered prudent to obtain two media samples each from the roofing material of both T112A and T112B, for a total of four samples. Samples will be taken by the RFETS CAS sample team in accordance with CAS SOP-003, Commodore Advanced Sciences, Waste Characterization Procedure, and section 3.1.1.2 of the Pre-Demolition Survey Plan, excerpted in Section 3.0, Sample Collection and Analysis.

## 2.0 DATA QUALITY OBJECTIVES

Decisions must be made as to whether Trailers T112A, T112B, and T112C are radiologically contaminated or eligible for free-release from the site. These decisions will be based on both radiological surveys and radiochemistry samples. This SAP and the DQOs within it only address the radiochemical characterization needs of the project, as radiological surveys shall be covered in a separate characterization package. Further, radiochemistry samples must be collected at the earliest possible time in the project to comply with the project's schedule constraints. Based on visual inspections and historical use of the trailers for administrative purposes only, potential of chemical hazards within or on the trailers has been ruled-out.

#### The Problem

The quantity and types of radioactivity and radioactive contamination present in and on the trailer are not known with adequate confidence to ensure compliance with free-release criteria; therefore, adequate measurements must be taken to properly characterized the trailers as contaminated or not contaminated. All areas of the trailer shall be characterized through radiological surveys; however, actinides of interest within bulk material on two of the trailer rooftops (Trailers 112A and 112B) must be established through radiochemical analysis because initial radiological surveys (fixed contamination) indicate contamination, but based on site history and process knowledge, naturally-occurring radionuclides (not of DOE origin) are suspected.

#### **Identification of Decisions**

What types and quantities of radioactive contamination exist in the bulk matrix of roofing materials, and if present, is contamination above or below free-release levels for the actinides of interest?

#### Inputs to the Decisions

Inputs to the decision rule include

- radiochemistry results (Pu-239/40, Am-241, U-233/234, U-235, and U-238) from the four samples of interest -- 2 from Trailer 112A and 2 from Trailer 112B,
- quality assurance aspects of the data, including precision, accuracy, representativeness, completeness, and comparability (i.e., the PARCC parameters),
- o gross alpha & beta (for DOT shipping limits and compliance),
- unrestricted release criteria (1-P73-HSP-18.10, Appendix 1).

Radiological instrumentation planned for the project is controlled by K-H Analytical Services Division through contractual requirements with onsite and offsite (radiochemistry) vendors. All instrument sensitivities are adequate for producing results comparable to free-release action levels and compliance with DOT requirements.

#### **Definition of the Boundaries**

Three-dimensional boundaries for defining the levels and extent of radioactive contamination are given restricted to the Trailer rooftop exteriors referenced above.

There are no temporal boundaries relative to technical data quality; time constraints depend only on project schedule.

#### **Decision Rules**

After conversion of radiochemistry concentrations (from bulk samples) to dpm/100 cm², if the sum-of-ratios of the collective suite of actinides is less than unity (1) for each sample (using the Appendix 1, 1-P73-HSP-18.10 [based on DOE Order 5400.5] free-release level of 100 dpm/100cm2 in the denominator of each ratio), the associated rooftop contains no DOE-added radiological contamination; otherwise, the rooftop material is contaminated and is considered low-level waste.

The use of this decision rule has precedence through its implementation by radiological engineering on the Building 779 Decommissioning Project, and subsequent approval of the methodology and results by DOE RFFO, CDPHE, and EPA Region VIII.

#### **Limits on Decision Errors**

Based on homogeneity of the bulk material in question, a statistical sampling of the roofs in not necessary, and thus statistical error on the sample set results is not applicable. Random counting errors that are actinide- and sample-specific will be reported with all results, and are typically <10% at elevated levels and <20% at levels near the MDC.

#### Optimization of the Sampling Design

If results indicate contamination levels greater than free-release levels, additional samples will be planned to better characterize the trailers in total.

#### 3.0 SAMPLE COLLECTION AND ANALYSIS

T112A is constructed with a tar paper roof that has been painted at some time after installation with a heat reflective paint.

T112B has a heavily oxidized metal roof. Previous surveys of site trailers of similar age and construction have exhibited high alpha count rates due to the deposit of naturally occurring radioactive materials (such as Po-210 or radon daughters) in this porous oxide layer.

For each trailer (T112A and T112B), two locations will be selected by Radiological Engineering based on experience and professional judgement. A minimum of 125 gm is required for each analytical sample, and an additional 125 gm is required for the accompanying radscreen sample at each sample location. The radscreen sample will be taken immediately adjacent to the analytical sample. The individual weight of all samples will be determined using a calibration-certified scale and recorded. The samples will consist of square or rectangular sections with a surface area of a minimum of 100 cm², and this surface area will be measured with a ruler or tape measure and recorded. These samples will be sent to an off site laboratory and analyzed for the five RFETS isotopes of concern (Pu-239/40, Am-241, U-233/234, U-235, and U-238) to ensure that no DOE

radioactive material is trapped beneath the heat reflective paint. The analytical laboratory Statement of Work will be modified such that the complete sample is tare weighed and digested, and that in addition to providing a concentration-based result (i.e., pCi/gm), the laboratory will be required to provide a total activity per isotope for the entire sample.

Pre-sampling and post-sampling radiological surveys will be required.

NOTE: T112C, which is also located in the vicinity of T112A and T112B, is the youngest of the three trailers and has a rubberized textile roof that is in good condition. Little or no alpha activity is anticipated. Its roof will not be sampled since previous survey activities exhibited activity less than DCGLs.

Samples will be collected using the sampling techniques described in CAS SOP-003, Commodore Advanced Sciences, Waste Characterization Procedure. Roofing material will be removed utilizing a utility knife or tin snips, as required by the material. A water spray mist will be used as necessary in order to prevent generation of dust, due to the (low) potential for asbestos in the roofing material. No asbestos characterization of the roof will be performed. Glass sample jars will be used to collect samples, and signed custody seals will be applied after sample collection. Quality control samples, such as rinsates, duplicates, and trip blanks, are not required for this effort.

#### 4.0 SAMPLE DESIGNATION

Each sample will be assigned a unique number in accordance with the RFETS Analytical Services Division (ASD) requirements. The unique sample number will be broken down into the following three parts:

- Report Identification Number (RIN)
- Event Number
- The Bottle Number

The first part of the number will be the RIN, which is assigned by the ASD. The RIN is used by the ASD to track and file analytical data. It is expected that one RIN will be assigned, however, if the project is not completed quickly, ASD may assign additional RINs. The RIN will be a seven digit alphanumeric code starting with "99" for 1999. The RIN will be followed by a dash "-" and then the event number. The event number is a three digit code, starting with "001" under the RIN, and will be sequential. Each typical sample location will have a unique event number under the RIN. The event number will be followed by a period "." and then the sequential bottle number. The bottle number will be used to identify individual sample containers collected at the same location and same event number.

In addition to the sample numbering scheme above, additional information will be collected with respect to each sample. This additional information will include:

- Sample type
- Location code

#### 5.0 SAMPLE HANDLING AND DOCUMENTATION

Sample custody will be maintained and documented using RFETS chain of custody forms. Sampling equipment (e.g., utility knife, tin snips) will be decontaminated between sampling locations. Decontamination will be performed using a spray rinse of distilled or deionized water followed by wiping with a KimwipeTM. The sampling tool will then be visually verified free of contamination, prior to its next use. Sampling information shall be documented on field log sheets or notebook. The originator shall authenticate (legibly sign and date) each completed hardcopy of the data. A peer reviewer, someone other than the originator, shall perform a review of the logsheet/notebook. The peer reviewer shall authenticate each hardcopy completed by the originator. Any modifications shall be lined-through, initialed, and dated by the reviewer (in ink). The QA Records for the project include the field log sheet and chain-of-custody forms.

### 6.0 PROJECT ORGANIZATION

Table 6-1 lists the responsible personnel assigned to this project, their responsibilities and contact information.

Table 6-1 Personnel Supporting the T112 A and T112B Roofing Characterization

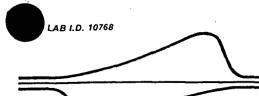
Name	Responsibility	Phone	Pager	Radio
Paul Wojtaszek	Project Manager	3125	None	3723
Dave Barnes	Radiological Engineer	5352	212-6541	3759
Dave Farler	Industrial Hygiene	4340	212-6555	3734
Dan Lippencott William Santiago	Commodore Sample Team	5267	212-3129	3502
Michelle Hershey	- Cam			
Greg DiGregorio	Quality Assurance	5688	212-6206	none
Marla Broussard	Characterization Manager	6007	212-6261	none
Stan Jablkowski	Radiological Control Technician	2397	none	none
Letty Cooper	Radiological Operations Supervisor	2397	212-2333	3208

### Appendix 7

**Historical Inspection Report for T112A** 

ASBESTOS - TEM, PCM, PLM, SEM METALS - AA, FLAME/FURNACE AIRBORNE PARTICULATES SPECIAL PARTICLE ANALYSIS

MV[AP] LAB NO. 1896



# Reservoirs Environmental

# SERVICES, INC.

1827 GRANT STREET

DENVER, COLORADO 80203

(800) 678-7374

(303) 830-1986

FAX (303) 863-9196

July 18, 1994

Ms. Julie Linkus EG&G Rocky Flats Plant PO Box 464 Golden, CO 80402-0464

23586JL/147A Samples: Bulk No. RES 20768 112A9407137301, 112A9407137302, 112A9407137303, 112A9407137306, 112A9407137304, 112A9407137305, 112A9407137309, 112A9407137307, 112A9407137308, 112A9407137312 112A9407137310, 112A9407137311, 112A9407137313.

Dear Ms. Linkus:

Reservoirs Environmental Services, Inc. (RES, Inc.) has analyzed 13 bulk material samples by Polarized Light Microscopy (PLM) for asbestos content as per your request. The samples were received on July 14, 1994, and initial results were telephoned to your office on July 18, 1994. PLM was used to analyze the bulk materials in compliance with guidelines established by the USEPA (40 CFR Part 763, Subpart F, Appendix A). The Analytical Results are presented in Table I.

RES, Inc. has assigned job number RES 20768 to this study. This report is considered highly confidential and the sole property of EG&G Rocky Flats Plant. RES, Inc. will not discuss any part of this study with personnel other than those of the client company. Samples will be disposed of after sixty days unless longer storage is requested. The US EPA guideline (40 CFR Part 763, Subpart F, Appendix A) was developed for use on friable building materials and is not recommended for non-friable materials such as floor tiles. RES, Inc. recommends additional analyses to confirm negative PLM results on floor tiles.





### SERVICES, INC.

P 7 3

#### TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number:

**RES 20768** 

Client:

**EG&G Rocky Flats Plant** 

Client Project:

23586JL/147A,

Date Samples Received:

July 14, 1994

Analysis Type:

PLM Short Report

Turnaround:

Client	Lab ID	TOTAL	L	Physical		ASBESTOS CO	NTENT		n-Ast					Non-Fibrous
Sample	Number	TOTAL ASBESTOS	a	Description	of Total	BY LAYER		С	Com G	•		(%)		Components
Number		ASBESTOS	y e		(%)			E .	ı	S Y	H A	W O	T A	(%)
	•	1	r		(70)	Mineral	Visual	L	A	N	î	L	· ~ [	
	·	(%)					Estimate (%)	L	S	T H	R	L	С	
12A9407137301	EM 128531	ND	Α	Tan paint	3		ND	0	0	0	0	0	0	100
•			В	Tan & brown fibrous material	12		ND	97	0	0	0	0	0	. 3
			С	White fibrous plaster	85	ļ _.	ND	10	0	0	0	0	0	90
12A9407137302	EM 128532	ND	Α	Tan paint	3		ND	0	0	0	0	0	0	100
			В	Tan & brown fibrous material	12		ND	97	0	0	0	0	0	3
			С	White fibrous plaster	85	 	ND	10	0	0	0	0	0	90
112A9407137303	EM 128533	ND	A	White paint	5		ND	TR	0	0	0	0	0	100
			В	Brown fibrous material	95		ND	97	0	0	0	0	Ö	3
112A9407137304	EM 128534	ND	A	White paint	5		ND	TR	0	0	0	0	0	100
, , , , , , , , , , , , , , , , , , , ,			В	Brown fibrous material	95		ND	97	Ŏ	Ŏ	ŏ	ŏ	ŏ	3
112A9407137305	EM 128535	ND	A	White paint	5		ND	TR	0	0	. 0	0	0	100
	•		В		95		ND	97	Ō	Ō	Ō	Ŏ	Ŏ	3
112A9407137306	EM 128536	ND	A	White paint	5		ND	TR	0	0	0	0	0	100
	,=-		В	•	95		ND	97	Ŏ	.0	Ŏ	ŏ	ŏ	3
112A9407137307	EM 128537	ND	A	White paint	5	ļ	ND	TR	0	0	0	0	0	100
			В	Tan fibrous material	95		ND	97.	Ŏ	Ŏ	Ö	Ō	Ö	3
				·			ND	0	0	0	^	^		100
							טאו		J	U	0	. 0	0	100
ND = None Detected	CELL = Cellulo	se ORG = Org	ganic	WOLL = Wollastonit	θ	GYP = Gypsum		Analys	st: BC	3				<del>                                     </del>
TR = Trace	Mat = Materia	BRUC = B	rucit	Trem-Act = Tremolite-Actinolit	0 .	SYNTH = Synthe	tic	·						Data QA



### RESERVOIRS ENVIRONM

## SERVICES, INC.



NVLAP Accredited Laboratory ... 1896

# TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number:

**RES 20768** 

Client:

**EG&G Rocky Flats Plant** 

Client Project:

23586JL/147A,

Date Samples Received:

July 14, 1994

Analysis Type:

PLM Short Report

Turnaround:

Client	Lab ID		L	Physical		ASBESTOS CO	NTENT	Not		best				Non-Fibrous
Sample	Number	TOTAL	а	Description	of Total	BY LAYER				npon		(%)	)	Components
Number	•	ASBESTOS	У		Sample		1	С	Ģ	S	Н	W	Т	(%)
		•	е	•	(%)			E	L	Y	Α	0	Α	ŀ
	•	,,,,	r			Mineral	Visual	L	Α	N	ı	L	Ł	
		(%)					Estimate	L	S	T	R	L,	С	
							(%)		<u>s</u>	Н				
112A9407137308	EM 128538	ND	Α	Gray resin	5		ND	0	Ö	0	0	0	0	100
			В	Ten fibrous woven material w/tan resin	20	·	ND	98	.0	0	0	0	0	2
			С	Gray fibrous woven material w/multicolored fibrous woven material	75		ND	0	. 0	95	0	0	0	5
112A9407137309	EM 128539	1.8	Α	Gray resinous material	5	1	ND	0	0	0	0	0	0	100
		ı	В	Tan resin	7	•	ND	0	0	0	0	0	Ö	100
	•	-	С	Tan fibrous woven material	. 8		ND	98	0	0	0	0	0	2
			D	White tile	15	Chrysotile	12	0	0	0	0	0	0	88
			Ε	Silver metalic	25		ND	0	0	0	0	0	0	100
			F	Multicolored fibrous woven material	40		ND	0	0	99	0	0		1
112A9407137310	EM 128540	1.8	Α	Black fibrous tar	7	Chrysotile	25	5	TR	0	0	0	0	70
			В	Tan resin	8		ND	0	0	0	0	0	0	100
		•	С	Tan fibrous resinous material	25		ND	40	5	20	0	0	0	35
			D	Multicolored resinous tile	60	٠,	ND	0	0	Ó	0	0	0	100
	•			4.111.1.							_			M
ND = None Detected	CELL = Cellulo	-		•	-	GYP = Gypsum								
TR = Trace	Mat = Material	BRUC = Br	ucite	Trem-Act = Tremolite-Actinolit	.0	SYNTH = Synthe	tic							Dáta QA



# RESERVOIRS ENVIRONME SERVICES, INC. NVLAP Accredited Laboratory ... 1896



## ABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

ES Job Number:

**RES 20768** 

:lient:

EG&G Rocky Flats Plant

lient Project:

23586JL/147A,

ate Samples Received:

July 14, 1994 PLM Short Report

nalysis Type:

urnaround:	

Client	Lab ID	7074	Physical		ASBESTOS CO	ONTENT	No		besto			' 1	Non-Fibrous
Sample	Number		a Description	of Total	BY LAYER	i	_	Con	pone		(%)	' _	Components
Number		ASBESTOS	<i>(</i>	Sample		1	C	G	S	Н	W	Ţ	(%)
		1 '		(%)	NA:1	\/!==1	Ε.	L	Y	Α.	0	_ ^	
		,,,,	Γ		Mineral	Visual	L	A	N		L		
. •		(%)				Estimate (%)	L.	S S	Н	R	L	С	<u> </u>
12A9407137311	EM 128541	0.9	A Black fibrous tar	3	Chrysotile	30	5	TR	0	0	0	0	65
12/10 10/10/11		Ł.	3 Tan & brown resin	7	• •	ND	Ó	0	Ō	0	Ō	0	100
			C Tan fibrous resinous material	25		ND	45	10	10	0	0	0	35
		1	D Multicolored resinous tile	65		ND	0	0	0	0	0	0	100
12A940713731 <b>2</b>	EM 128542	ND	A Tan fibrous material	3	<u>.</u>	ND	98	0	0	0	0 .	0	2
			B Tan resin	7		ND	0	0	0.	0	0	0	100
		'	C White & tan tile	90	٠.	ND	0	0	0	0	0	0	100
12A9407137313	EM 128543	2.7	A Black tar	10		ND	TR	0	0	0	0	0	100
		ļ	B White & tan tile	90	Chrysotile	. 3	0	0	0	0	0	0	97
•			•			*							0
D = None Detected	CELL = Cellulos	e ORG = Organ	nic WOLL = Wollastor	nite	GYP = Gypsum		•						1/1
R = Trace	Met = Material	BRUC = Bruc	ite Trem-Act = Tremolite-Actino	lite	SYNTH = Synthe	tic							Deta QA

1. Sample Jidg-Y-M-I 1 1 2A 9 4 C		l l	ROCKY FLATS PLANT FRIAL HYGIENE BULK SAI	<del></del>
2. Process Title:		6. Analytical Sam	ple Method: PLM	
3. Subprocess Title:		7. Lab Report #:		
4. Building/OU Etc.:	T 112A	8. Lab Method:		
5. Chain of Custody Sea	l#:	9. Related Forms	»:	
10. Sample # (Bldg-Y-M-D-P#-S#)	11. Location information	12. Material Type	13. Bulk Sample Description	14. Results
		of + caron)		
	Wall- SW Corner (near water of			
11249407137302	Wall - East South Middle (Betu	Conrast rooms	RG (o	
11249407137803	Ceiling-nearlyH(East)		RG 6	
	Ceiling - above doorway rear		RG(o	
	Exit sign			
11819407137305	reiling-fast (near window)		RG 7	
112A9407137308			R67	
142 noun 11 12 40	Aniling aus		its (cus)	
112 A9407137307	Ceiling (Hallway outside Ristroom	3	1867	-
11279407137308	Floor St corner count flooring		RG8	
	Floor West Behind refrigerator		RG (9)	
	Floor Mens Rest Room Entry	1	RC 8	
	Floor Womens Rest Room Entre		RG8	
	Floor tile (infront of copies)			
	Floor tile - foot closet			
		4		
		\\/		
15. Sampled by/Date:	un 20 7/13/94	16. Checked by/D	Date (Check Back of Form):	

## **EG&G Rock**

## Plant, Inc.

Golden, O --02-0464

Safety and Hygiene Chain of Custody Record and Analysis Request

Name of Originator: _{VV. D.} L	CK WOOD Title:	debestus (	Cordinator	Bldg/	Ext:	T441A13	484 Date: 7-13-9	4 Pag	ge / of /
SAMPLE NUMBER Bldg/Y/M/D/P#/S#	ANALYZE FOR	VOLUME liters	SAMPLE TIME/	MEDIA	P A B	Personal Area Bulk	REMARKS	·	Lab Number
11219407137301	Abestos				В				
11719407127302	Abes 635				1				
112 A 94 07 13 73 03	Ashrstus				11-				
11207467137304	Ashytas	<u>.</u>		· · · · · · · · · · · · · · · · · · ·	11_				· · · · · · · · · · · · · · · · · · ·
112 49407137305	Ashbestos				Ш_	ļ			
11209467137306		·			-		·	······································	
11209407137307					Ш_				
11249407137308					11_		· · · · · · · · · · · · · · · · · · ·		
112 19407137309					Ш_				
112 494 07137310					Ш_	ļ			
112 494 07/373 1/					11_				
11249407137312				· · · · ·	Ш_		<u> </u>		
11287407137313					<del>  </del> -			· · · · · · · · · · · · · · · · · · ·	
					<u> `</u>				
					ļ				
	<u> </u>		<u> </u>		<u> </u>	<u></u>			
Relinquished by	Received by	Time	/Date フ-/3:5//	Relinqu	ishe	d by	Received by	Time	/Date
Relinquished by	Received by	Time	/Date	Relinqu	ishe	d by	Received by	Time	/Date
Relinquished by	Received by	Time	/Date	Relinqu	ishe	d by	Received by	Time	/Date
Relinquished by	Received by	Time	/Date	Relinqu	ishe	d by	Received by	Time	/Date
Report and Billing Ins	truction		Analysis	s Request			Seal# (Release #) /4	17A-	<u>., </u>
Verbal To: N/1				ygiene Sam	ple		Condition of Seal:  Broken	☐ Unbr	oken
Fax To: IM / NKVS		Standard	Rush	Other				1	
Report To:	•	Service	Achaeta	s Samples			Signature:		
Bill To: <u>FG+G</u>				<b>.</b>	_	.	Comments:		·
P.O.#/Release: <u>23.5 و ما ل</u>	<u> 147A</u>	Standard	-				<del></del>		
Lab: Freudy		Service		ush					

# Rocky Flats Plant Asbestos Containing Material INSPECTION CHECKLIST Appendix 1

1.	Inspector W.O. Lackwood Signature Wolfer Signature	<u>)                                    </u>	Accreditation # State _CO
2.	BUILDING NO.: T112A	0.0	ASSESTOS FORM CODE:
2	BLDG. AREA CODE:	8.2	D 1. Alr cell D 6. Pre-formed
	# 1. 1st Figor D 6, Crawl Space		D 2. Blanket D 7. Shoot
	12. 2nd Floor D. 7. Roof		D S. Block D S. Sprayed On
	D a. 3rd Floor D B. Exterior of Bidg.		
	Q 4. 4th Floor Q 9. Plenum		D 4. Cloth D 9. Troweled On D 5. Loose fill B 10. Other: Olaced tile
	D 5. Basement D 10. Other		
		8.9	COLOR CODE:
3.	ROOM NUMBER:	7,7	D B Blue D O Orange
٠.	COLUMN NUMBERS		D BL Black W White
			D BR Brown / DY Yellow
4.	SPECIFIC LOCATION <u>NE COMPE</u>		D G Green D OT Other:
٠.			D GGray
5.	% FUNCTIONAL SPACE 10070		
_		10.	CONSISTENCY:
6.	FUNOTIONAL SPACE LD. 22		Brittle - hard D Fibrouse - loose
	HOMOGENEOUS AREA LD. 04 - FICOR STRUCTO	re	☐ Semi - zolid ☐ Granular • pliable
7.	MATERIAL TYPE CATEGORY:	11.	CURRENTLY FRIABLE:
	Q T. Thermal System Insulation		☐ Yes ■ No
	Surfacing Material		
•	M Miscellaneous Material	12.	CURRENT MATERIAL DAMAGE:
	•		1. No Visible Damage (U)
8.1	TSI ACM:		D 2. Damaged (D)
•	PIPE LENGTH (FT)		< 10% Localized or
8.2	TSIACM:		< 25% Distributed
_	PIPE DIAMETER (IN.)		Q 3, Significant Damage (S)
8,3	TSI ACM:		10% or more Localized or
	FIPE WITH INSULATION DIAMETER (IN.)		25% or more Distributed
R.Æ	SURFACING MISC. ACM:	12.1	CAUSE OF DAMAGE:
	TOTAL SURFACE MATERIAL (SQ. FT.)		D 1. Area Usage
<b>717</b>	900 so.ft.		Q 2. Vibration
ء ۾	SURFACINGMISC ACM:		Q 3. Air Flow
~*	DEPTH OF SURFACE MATERIAL (IN.)		D 4, Water Damage
	14 inch		D. S. Service Activity
			D. 6. Usual Aging
 N. d.	EL NOTION COOR:	•	D 7. Other:
4.7	FUNCTION CODE:  1 1. Acoustic Insulation		- · · · · · · · · · · · · · · · · · · ·
		19	CONTAMINANT PRESENT:
			<b>5</b> C. None
			1. Spotty
			2. Widely Scattered
	C) 5. Celling Tile C) 23. High Temp Water Pipe	-	Q 3. Entire Area
	Q 6. Chilled Water Pipe Q 24. High Temp Water		a of mine was
	D. 7. Chilled Water Pipe Fitting Pipe Fitting	u	DICDCDGAL EACTION:
	D 8. Cold Water Pipe D 25. Mastic Adhesive	14.	DISPERSAL FACTOR:  1. Water 8.3. Occupant
	D 9. Cold Water Pipe Fitting D 26. Roofing		D 2. Air D 4. Machinery
	O 10. Condensate Pipe O 27. Steam Pipe		W STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STA
	Q 11. Condensate Pipe Fitting Q 28. Steam Pipe Fitting	16	AREA USED BY:
	Q 12. Cooling Tower Baffles Q 29. Tank insulation	, 1 3.	Q Maintenance Workers
	☐ 13. Debris/Settled Dust ☐ 30. Transite Board		
	D 14. Domestic Cold D 31. Vibration Damper		Operations Workers
	Water Pipe   32. Wall Board		2 Administrative Personnei
	□ 15. Domestic Cold □ 33. Wall insulation		Q Visiting Public
	Water Fitting Q 34. Wall Plaster/Spackie		
	□ 18. Door □ 35. Other:		
	□ 17. Drain Pipe		
	O 18. Dust Insulation		

•							
		·					
.)				·			
• • • • • • • • • • • • • • • • • • • •							
		•				<b>~</b> 11.	
16.	POTENTIAL FOR DAMAGE:		20.		DED RESPONSE ACT	ON:	
	■ Low Potential for dama	ige (L)		O 1. Respon			
	D Potential for damage (				188 Action #2		
	D Potential for significant				nee Action #3		
	<b>2</b> 1 01000000			4. Respons	rse Action #4		
171	DISTURBANCE POTENTIAL			D 5. Respon	ree Action #5		
17.1	FREQUENCY OF CONTACT/	ACCESSIBILITY:			188 Action #6		•
	O. Low/Saidom	(< 1 time/month)		D 7. Respon	ise Action #7		
	a. comodicom	(e.g., Area Rarely Used)		B. Respon			
	1. Moderate/Occasional			,			
	1. Moorata Coccasin	(e.g., Rooms/Offices)	21.	DAMAGED IN	VENTORY PRIORITY	,	
	D. S. Lillah/Facessandis	(>4 times/month)		01 02		3	
	D 2. High/Frequently						
		(e.g., Hallways/Corridors)	99	PLANNED AC	TIVITY:		
			~~.	O New Acti			
17.2	DISTURBANCE POTENTIAL			C Green Von			
	INFLUENCE OF VIBRATION:			C Dominad	almenance O/A		
	8 0. Low/None	•		☐ Required I	•		•
	1. Moderate/Noticeable			□ Renovation			
		a, vibrating ducts w/o fan, etc.)		Demolition	n		
	2 High/Extreme						
	(Easily sensed vibrate	tion, vibrating duct w/fan, etc.)	23.		EMS IMPACTED:	. ^	
				☐ System S	hutdown	1/7	•
	DISTURBANCE POTENTIAL			D Backup Sy	***************************************	11 -	
	OTENTIAL FOR AIR EROSI	ON:		O No Backu	p/Altemate		
	. 0, Low/None			☐ Routine S	ystem Maintenance	t	
	1. Moderate or Noticeal	ble Movement					
	(Air shaft, Air stream	i, vent, etc.)	24.	POTENTIAL V	VASTE:		
	D 2. High/Extreme veloci			Non friable	<del>)</del>		
		Shaft, Fan Room, etc.)		D Regulated	ACM		
	( an ( random Zariana			•	al Contaminated		
17.4	DISTURBANCE POTENTIAL			D RCRA Con			
	OVERALL POTENTIAL FOR	DAMAGE:					
	O. Low Potential for Dar		25	SAMPLING:			
	O 1. Potential for Damage	-	٠.,		CM, < 1000 ft.2		
				*	CM, < 5,000 ft.2		
	<ul> <li>2. Potential for Significa</li> </ul>	in Daniage					
	TO THE POPULATION	TEACHY DIA			CM. > 5,000 fL ²		•
	PHYSICAL ASSESSMENT CA			□ ≥ 9, Non A			
	D 1. Demaged or Significan			Q 0, Assumed	J AUM		
	2. <u>Damaged</u> Friable Sur		55.4				
	3. Significantly Damage		25.1				-
	O 4. Damaged or Significan			Sample #	<u> </u>	Asbestos	
	D. S. ACBM with Potential			9	1.8	Chaise	Stile
	D. B. ACBM with Potential					1	
1	u 7. Any remaining Friable	ACBM or Friable suspect ACBM					
		A STORAGE A STORAGE A	-				
	HAZARD POTENTIAL CLASS		-				
1	1. ACBM in good cond	ning whom potential for					
	disturbance	Made and a second and a					
		dition w/potential for damage					
1		<u>idition</u> w/potential for significat	nt ——				
	demage		25.2	LAB REPORT			
		condition w/low potential for	ع،د	HEROKI	<del></del>		
	disturbance		20	Wady barya	SE TA ILISEDO		
		condition w/potential for	æ.	WORK PACKA	ב מטאמכאט		
	damaga		•	<del></del>			
	6. ACBM in Damaged		~~	001111	Carpot con	101	
	significant dama		21.	TOMMENTS:	upu !!!	141	
•	7 7 ACRM in a Significanti	Contino beneard v		1112	<u>-</u>		

# Rocky Flats Plant Asbestos Containing Material INSPECTION CHECKLIST Appendix 1

1.	Inspector W.O. Lackwood Signature Wolander	<u>ノ</u>	Accreditation # State _CO
	Date 7-43-94		
2.	BUILDING NO .: FITZ-A	9.2	ASSESTOS FORM CODE:
_	BLDGL AREA CODE:	٠.ــ	D 1. Air cell 8 6. Pra-formed
	A. 1. 1 St Fisor D 6. Crawl Space		D 2. Blanket D 7. Sneot
	Q 2, 2nd Floor Q 7. Roof		□ S. Block □ S. Sprayed On
	D 2. 3rd Floor D 8. Exterior of Bidg.		□ 4. Cloth □ 9. Troweled On
	12 4. 4th Floor 12 9. Plenum		D 5. Loose fill D 10. Other:
	D 5. Basement D 10. Other		
		8.8	COLOR CODE:
3.			D. B. Biue D. O. Orange
	COLUMN NUMBERS NIA		D BL Black O W White
			☐ ER Brown ☐ Y Yellow
4.	SPECIFIC LOCATION CloseT NW Com		D G Green D OT Other:
_	TWOTIONS ADAPT 100%		■ GrGray
5.	% FUNCTIONAL SPACE 100%	<∩	CONSISTENCY:
_	FUNOTIONAL SPACE LD. 04	10.	■ Britile - hard □ Fibrouse • loosa
6.	HOMOGENEOUS AREA LD. 05		Semi - solid    Granular - plable
	MONTOGERECOUS AREA ID		G cents - solid G cimings - humas
7.	MATERIAL TYPE CATEGORY:	11.	CURRENTLY FRIABLE:
	D. T. Thermal System Insulation		☐ Yes ■ No
	D. 8. Surfacing Material		
	M Miscellaneous Material	. 12.	CURRENT MATERIAL DAMAGE:
			1. No Visible Damage (U)
8.1	TSI ACM:		D 2. Damaged (D)
	PIPE LENGTH (FT)		< 10% Localized or
8.2	TSI ACM:		< 25% Distributed
:	PIPE DIAMETER (IN.)	•	O. 3. Significant Damage (S)
. 8.3	TSI ACM:		10% or more Localized or
,	PIPE WITH INSULATION DIAMETER (IN.)		25% or more Distributed
	SURFACING MISC. ACH: 18 SQ +7	40.4	1 CAUSE OF DAMAGE:
8.4	TOTAL SURFACE MATERIAL (SQ. FT.)	12.1	D 1. Area Usage
8.0	IOINT SOULACE WATEUME (See L.1)		Q 2. Vibration
	SURFACINGMISC ACM:		Q 3. Air Flow
5-4	DEPTH OF SURFACE MATERIAL (IN.)		4. Water Damage
•	1/4		D 5. Service Activity
			6. Usual Aging
9.1	FUNCTION CODE:	•	☐ 7. Other:
	Q 1. Acoustic insulation Q 19. Exterior Construction		. •
	D 2. Baseboard 20. Floor Tile	13.	CONTAMINANT PRESENT:
	D 3. Boller/Furnace insulation D 21. Fire Stop		C. None
	Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari     Caulking Mari		1. Spotty
	5. Ceiling Tile U. 23. High Temp Water Pipe		2 Widely Scattered
	D 6. Chilled Water Pipe D 24. High Temp Water		Q 3. Entire Area
	D 7. Chilled Water Pipe Fitting Pipe Fitting	4.1	nicocaess Escarco.
	© 8. Cold Water Pipe © 25. Mastic Adhesive	14.	DISPERSAL FACTOR:  1. Water 23. Occupant
	D 9. Cold Water Pipe Fitting D 26. Roofing		D 2. Air D 4. Machinery
	O 10. Condensate Pipe O 27. Steam Pipe		U Z AIF U 4. Machinery
	Q 11. Condensate Pipe Fitting Q 28. Steam Pipe Fitting Q 12. Cooling Tower Baffles Q 29. Tank insulation	15.	AREA USED BY:
	12. Cooling towar Ballies 225. Talk theolator	, , , , ,	Maintenance Workers
	14. Domestic Cold Q 31. Vibration Damper		Operations Workers
	Water Pipe D 32. Wall Board		Administrative Personnel
	D 15. Domestic Cold D 33. Wall insulation		Q Visiting Public
	Water Fitting Q 34. Wall Plaster/Spackle		
	□ 18. Door □ 35. Other:		
1	O 17. Drain Pipe		•
7	D 18. Duct Insulation		

3 B	•		• •		
•	•				
		20	permitted	DED RESPONSE A	CTION:
16.	POTENTIAL FOR DAMAGE:	20.	_	onse Action #1	DIKIN.
	Low Potential for damage (L)		•	onse Action #2	
	Potential for damage (M)		•	nse Action #3	
	Potential for significant damage (H)		•	nse Action #4	•
	- mind on the north Mil		•	nse Action #5	
17.	1 DISTURBANCE POTENTIAL		•	nse Action #6	•
	FREQUENCY OF CONTACT/ACCESSIBILITY:		•	nse Action #7	
	a. Low/Seidom (< 1 time/month)			nse Action #8	·
	1. Moderate/Occasional (1-4 times/month)		<b>4</b> 5. 1165pv	ling Verroit Ao	
	(e.g., Rooms/Offices)	91	DAMAGED W	VENTORY PRIOR	πv
	2. High/Frequently. (>4 times/month)	~			 . 3
	(e.g., Hallways/Corndors)		u , u.	~ ~~ -	
	(o.g.,)	22.	PLANNED A	CTIVITY:	
17	2 DISTURBANCE POTENTIAL		O New Act		
• • • •	INFLUENCE OF VIBRATION:		B System k		
	O. Low/None		O Required		
	☐ 1. Moderate/Noticeable		☐ Renovation		
	(Motors, loud sounds, vibrating ducts w/o fan, etc.)		D Demolition		
	D 2. High/Extreme				1
•	(Easily sensed vibration, vibrating duct w/fan, etc.)	23.	OTHER SYST	EMS IMPACTED:	N/A
			D System S		(*/ / ·
	DISTURBANCE POTENTIAL		D Backup S		
_	POTENTIAL FOR AIR EROSION:		O No Back		•
	# 0, Low/None		Q Routine S	ystem Maintenan	<b>ce</b>
	Q 1. Moderate or Noticeable Movement		•		
	(Air shait, Air stream, vent, etc.)	24.	POTENTIAL 1	NASTE:	
	2. High/Extreme velocity		Non friable	e	
	(Air Pienum, Elevator Shaft, Fan Room, etc.)		D Regulated		
			D Radiologic	al Contaminated	
17.4	DISTURBANCE POTENTIAL		D RCRA Cor	rtaminated	
	OVERALL POTENTIAL FOR DAMAGE:		•		*
	O. Low Potential for Damage	25.	Sawpling:		
	O 1. Potential for Damage		≥ 3, Non A	$1000 \text{ ft.}^2$	
	Cl 2. Potential for Significant Damage		□ ≥ 5, Non A	/CM, < 5,000 ft.2	
				CM, > 5,000 fL2	•
18.	PHYSICAL ASSESSMENT CATEGORY:		□ ≥ 9, Non A		
	1. Damaged or Significantly Damaged TSI ACM		O, Assume	d acm	
	Damaged Friable Surfacing ACM     Single-path Demond File Control ACM				
	3. Significantly Damaged Flable Surfacing ACM     4. Damaged Significantly Damaged Alice     4. According to Significantly Damaged Alice     4. According to Significantly Damaged Alice     4. According to Significantly Damaged Alice     4. According to Significantly Damaged Alice	25.1			
	O 4. Damaged or Significantly Damaged Misc. ACM 5. ACBM with Potential for Damage		Sample #	%	Asbestos Type
	D & ACBM with Potential for Significant Damage	L	013	2.7	Chaysotile
	1 7. Any remaining Friable ACBM or Friable suspect ACBM				7 0
	It's fattoning These Noom or These source Mobile				
18.	HAZARD POTENTIAL CLASSIFICATION:	<b>—</b>	<del></del>		<del></del>
	1. ACBM in good condition w/low potential for	-			<del></del>
	disturbance	-			
	C 2 ACBM in good condition w/potential for damage	-			
	Q 3. ACBM in good condition w/potential for significant	L			
	damage				
	7 4. ACBM in Damaged condition whow potential for	25.2	LAB REPORT		
_	disturbance				-
	5. ACBM in Damaged condition wipotential for	28.	WORK PACKAG		
	damage		<i>N/</i>	<u> </u>	- <del></del>
	D 6. ACBM in Damaged condition w/potential for			т.	
	significant damage		COMMENTS:		
:	7. ACBM in a Significantly Damaged condition	:	12 drost	Stape Just	- WED

# Rocky Flats Plant Asbestos Containing Material INSPECTION CHECKLIST Appendix 1

1.	inspector W.O. Lacksood Signature Wolfarden	ノ	Accreditation # State	CO
•••	Data 7.13.94	<del></del>		
2.	BUILDING NO.: 112A	9.2	ASSESTOS FORM CODE:	
_	BLDG. AREA CODE:	٧.٠	D 1. Air cell D 6. Pre-formed	
	1. 181 Figur 3 6. Crawl Space		D 2. Blanker D 7. Sheat	
	Q 2. 2nd Floor Q 7. Roof		D. S. Block D. B. Sprzyed On	
	3rd Floor     D. B. Exterior of Bidg.		1 4. Cloth 2 8. Troweled On	
	Q 4. 4th Floor Q 9. Plenum		D 5. Loose fill D 10. Other:	
			d B. EDOSE IIII d 10. Obiet.	
	D 5. Basement D 10. Other		001 67 0005	
_	ROOM NUMBER: Restrooms	8.8	COLOR CODE:	
3.			E Blue DO Orange	
	COLUMN NUMBERS		D BL Black Q W White	•
_	Faci Blda Contag		C ERBrown. C Y Yellow	•
4.	SPECIFIC LOCATION <u>East Bldg.</u> Center		D G Green D OT Other:	<del></del>
_			D. GRGray	
5.	% FUNCTIONAL SPACE			•
	10001-	10.	CONSISTENCY:	
6,	FUNOTIONAL SPACE LD. 100 10		■ Brittle - hard □ Fibrouse - loosa	
	FUNOTIONAL SPACE LD. 10670 HOMOGENEOUS AREA LD. 05		☐ Semi - solid ☐ Granular - pilable	
7.	*** *** *** *** *** *** *** *** ***	11.	CURRENTLY FRIABLE:	
	T. Thermal System Insulation		☐ Yes di No	
	□ & Surfacing Material			
	M Miscellaneous Material	12.	CURRENT MATERIAL DAMAGE:	
	•		■ 1. No Visible Damage (U)	
8.1	TSIACM:		D 2. Damaged (D)	
	PIPE LENGTH (FT)		< 10% Localized or	
8.2	TSI ACM:		< 25% Distributed	
	PIPE DIAMETER (IN.)		Q. 3, Significant Damage (S)	
	TSI ACM:		10% or more Localized or	
0,0	PIPE WITH INSULATION DIAMETER (IN.)		25% or more Distributed	
	LIC MILLINGO CATION OF WILL FILL WAY			
0 A	SURFACING MISC. ACM:	121	CAUSE OF DAMAGE:	
	TOTAL SURFACE MATERIAL (SQ. FT.)	1 =- 1	D 1. Area Usage	
8.0	30 50 ++		Q 2. Vibration	
			D 3. Air Flow	
8.6	SURFACINGMISC ACM:			
	DEPTH OF SURFACE MATERIAL (IN.)		□ 4. Water Damage	
	<u> 14 mai</u>		D. S. Service Activity	
·.			D 6. Usual Aging	*
8.1	FLINCTION CODE:	•	□ 7. Other:	<del></del>
	1. Acoustic Insulation 0 19. Exterior Construction	4.4	AALEST IN LAND DOMACLITY.	
	D 2. Baseboard D 20. Floor Tile	13.	CONTAMINANT PRESENT:	
	□ 3. Boller/Furnace insulation □ 21. Fire Stop		M O. None	
	4. Czulking Mati 22. Fireproofing insulation		1. Spotty	
	D 5. Celling Tile D 23. High Temp Water Pipe		☐ 2. Widely Scattered	
	D 6. Chilled Water Pipe D 24. High Temp Water		Q 3. Entire Area	
	D 7. Chilled Water Pipe Fitting Pipe Fitting			
	D 8. Cold Water Pipe 25. Mastic Adhesive	14.	DISPERSAL FACTOR:	•
	D 9. Cold Water Pipe Fitting D 26. Roofing		☐ 1. Water ■ 3. Occupant	
	O 10. Condensate Pipe O 27. Steam Pipe		D 2 Air D 4. Machinery	
	11. Condensate Pipe Fitting 2 28. Steam Pipe Fitting		•	
	12. Cooling Tower Baffles	15.	AREA USED BY:	
	D 13. Debris/Settled Dust D 30. Transite Board		☐ Maintenance Workers	
	14. Domestic Cold 231. Vibration Damper		Q Operations Workers	
	Water Pipe   32. Wall Board		Administrative Personnel	
	2 15. Domestic Cold 2 33. Wall Insulation		Q Visiting Public	
	Water Fitting Q 34. Wall Plester/Speckle	•		
	18. Door 25. Other:			
	Q 17. Drain Pipe			
	18. Dust insulation			

16. POTENTIAL FOR DAMAGE:  B Low Potential for damage (L)  D Potential for damage (M)	20. RECOMMENDED RESPONSE ACTION:  1. Response Action #1  1. Response Action #2
Potential for significant damage (H)	Ci 8. Response Action #3 Ci 4. Response Action #4
17.1 DISTURBANCE POTENTIAL FREQUENCY OF CONTACT/ACCESSIBILITY:	D. 5. Response Action #5     S. Response Action #6
© 0. Low/Seldom (< 1 time/month) (e.g., Area Rarely Used)	☐ 7. Response Action #7 ☐ 8. Response Action #8
<ul> <li>1. Moderate/Occasional (1-4 times/month)</li> <li>(e.g., Rooms/Offices)</li> </ul>	21. DAMAGED INVENTORY PRIORITY
<ul><li>Q 2. High/Frequently (&gt;4 times/month)</li><li>(e.g., Hallways/Corridors)</li></ul>	0 1 0 2A 0 2B • 3
17.2 DISTURBANCE POTENTIAL	22. PLANNED ACTIVITY: \( \) / \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \)
INFLUENCE OF VIBRATION:	O System Maintenance O Required Repair
<ul> <li>1. Moderate/Noticeable         (Motors, loud sounds, vibrating ducts w/o fan, etc.)     </li> <li>2. High/Extreme</li> </ul>	☐ Renovation ☐ Demolition
(Easily sensed vibration, vibrating duct w/fan, stc.)	23. OTHER SYSTEMS IMPACTED: 11
DISTURBANCE POTENTIAL     POTENTIAL FOR AIR EROSION:	Backup System in Use     No Backup/Alternate
▲ 0. Low/None  □ 1. Moderate or Noticeable Movement	Q Routine System Maintenance
(Air shaft, Air stream, vent, etc.)  © 2. High/Extreme velocity	24. POTENTIAL WASTE:
(Air Pienum, Elevator Shaft, Fan Room, etc.)	Regulated ACM     Radiological Contaminated
17.4 DISTURBANCE POTENTIAL OVERALL POTENTIAL FOR DAMAGE:	□ RCRA Contaminated
O. Low Potential for Damage     O. 1. Potential for Damage	25. SAMPLING:
2. Potential for Significant Damage	<ul> <li>≥ 5, Non ACM, &lt; 5,000 ft.²</li> <li>≥ 7, Non ACM, &gt; 5,000 ft.²</li> </ul>
18. PHYSICAL ASSESSMENT CATEGORY: (\//)  10. 1. Damaged or Significantly Demaged TSI ACM  2. Damaged Friable Surfacing ACM	D ≥ 9, Non ACM D 0, Assumed ACM
3. Significantly Damaged Friable Surfacing ACM     4. Damaged or Significantly Damaged Misc. ACM	25.1
D 5. ACBM with Potential for Damage	Sample # % Asbestos Type 10 (.8 Chrysotile
<ul> <li>□ 8. ACBM with Potential for Significant Damage</li> <li>□ 7. Any remaining Friable ACBM or Friable suspect ACBM</li> </ul>	11 . 9 Chrysotile
19. HAZARD POTENTIAL CLASSIFICATION:	
1. ACBM in good condition w/low potential for disturbance	
<ul> <li>2 ACBM in good condition w/potential for damage</li> <li>3 ACBM in good condition w/potential for significations</li> </ul>	ant
4. ACBM in <u>Damaged condition</u> willow potential for disturbance	25.2 LAB REPORT
5. ACBM in <u>Damaged condition</u> w/potential for damage	29. WORK PACKAGE NUMBERS
0 6. ACBM in <u>Damaged condition</u> w/potential for significant damage	27. COMMENTS: In RESTroom Need to Be notified
2 7. ACBM in a Significantly Damaged condition	if Cincleum 15

removed

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# Rocky Flats Plant Asbestos Containing Material

INSPECTION CHECKLIST Appendix 1 Signature BUILDING NO .: T-1/2 - A 9.2 ASSESTOS FORM CODE: ELDG. AREA CODE: O 1. Air cell D 6. Pre-formed 1: 1st Floor D 6. Crawl Space D 2. Blanket D 7. Sheet D 8. Sprayed On D 2, 2nd Floor D 7. Roof C 3. Biock D 3. 3rd Floor D 8. D 9. Troweled On Exterior of Blag. D 4. Cloth **Q**. 9. יום 10. Other: __*או*נאַרַ D 4. 4th Floor Plenum 5. Loose fill D 5. Basement □ .10. Other 9.3 COLOR CODE: ROOM NUMBER: O B Blue D O Orange D W White COLUMN NUMBERS D BL Black D Y Yellow ☐ BR Brown SPECIFIC LOCATION _ Company O OT Other: ☐ G Green D GR Gray % FUNCTIONAL SPACE _ 10. CONSISTENCY: T-112-A-f-DZ FUNCTIONAL SPACE I.D. _ ☐ Brittle - hard ☐ Fibrouse - loose □ Semi - solid □ Granular - pliable N/N-HOMOGENEOUS AREA I.D. T-1124-14-02 MATERIAL TYPE CATEGORY: 11. CURRENTLY FRIABLE: Thermal System Insulation ☐ Yes D S Surfacing Material X M Miscellaneous Material 12. CURRENT MATERIAL DAMAGE: 1. No Visible Damage (U) 8.1 TSIACM: 2. Damaged (D) PIPE LENGTH (FT) < 10% Localized or 1.2 TSIACM: < 25% Distributed PIPE DIAMETER (IN.) 3. Significant Damage (S) 10% or more Localized or PIPE WITH INSULATION DIAMETER (IN.) 25% or more Distributed N/A SURFACING MISC. ACM: 12.1 CAUSE OF DAMAGE: TOTAL SURFACE MATERIAL (SQ. FT.) D 1. Area Usage 1800 2. Vibration SURFACINGMISC ACM: 3. Air Flow DEPTH OF SURFACE MATERIAL (IN.) Q 4. Water Damage D 5. Service Activity 3 6. Usual Aging 9.1 FUNCTION CODE: 7. Other: 1. Acoustic Insulation D 19. Exterior Construction D 20. Floor Tile 13. CONTAMINANT PRESENT: D 2. Baseboard D 3. Boiler/Furnace Insulation D 21. Fire Stop ■ 0. None D 4. Caulking Mat'l D 22. Fireproofing Insulation ☐ 1. Spotty D 5. Ceiling Tile D 23. High Temp Water Pipe D 2. Widely Scattered □ 6. Chilled Water Pipe D 24. High Temp Water 3. Entire Area ☐ 7. Chilled Water Pipe Fitting Pipe Fitting 14. DISPERSAL FACTOR: D 8. Cold Water Pipe D 25. Mastic Adhesive 14 0 1. Water □ 9. Cold Water Pipe Fitting □ 26. Roofing □ 3. Occupant ☐ 10. Condensate Pipe D 27. Steam Pipe 🕽 2. Air D 4. Machinery D 11. Condensate Pipe Fitting D 28. Steam Pipe Fitting □ 12. Cooling Tower Baffies D 29. Tank Insulation 15. AREA USED BY:

Maintenance Workers

Administrative Personnel

Operations Workers

Visiting Public

D 13. Debris/Settled Dust

Water Pipe

Water Fitting

D 14. Domestic Cold

D 15. Domestic Cold

☐ 16. Door

☐ 17. Drain Pipe D 18. Duct Insulation D 30. Transite Board

G 33. Wall Insulation

□ 35. Other: <u>W</u>

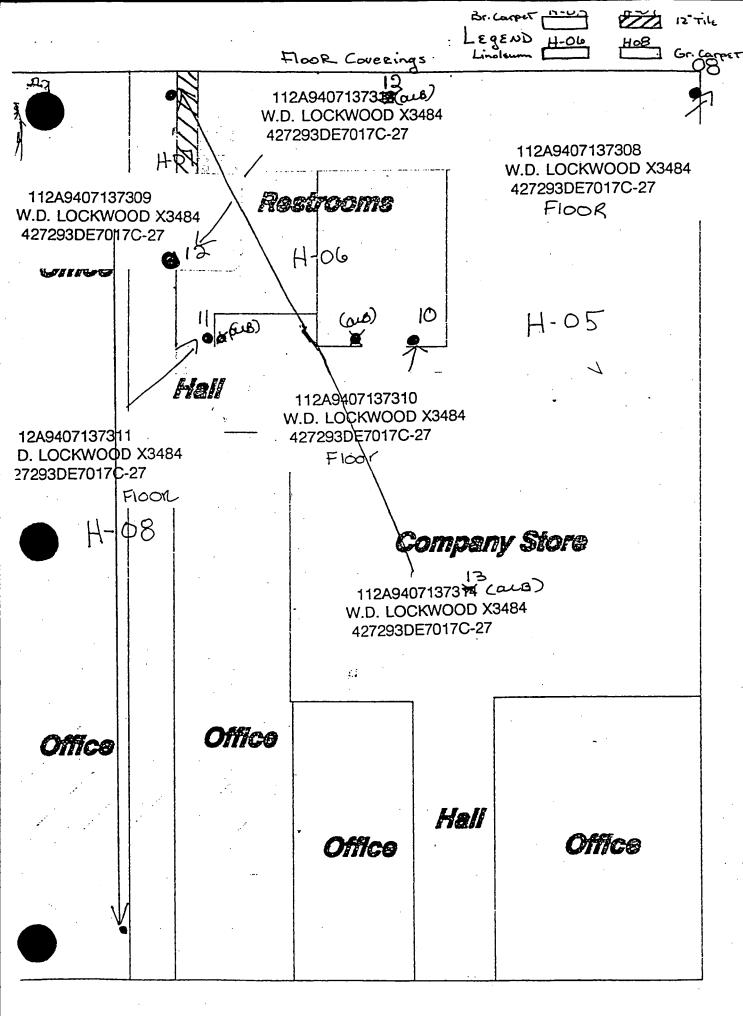
¥ 32. Wall Board

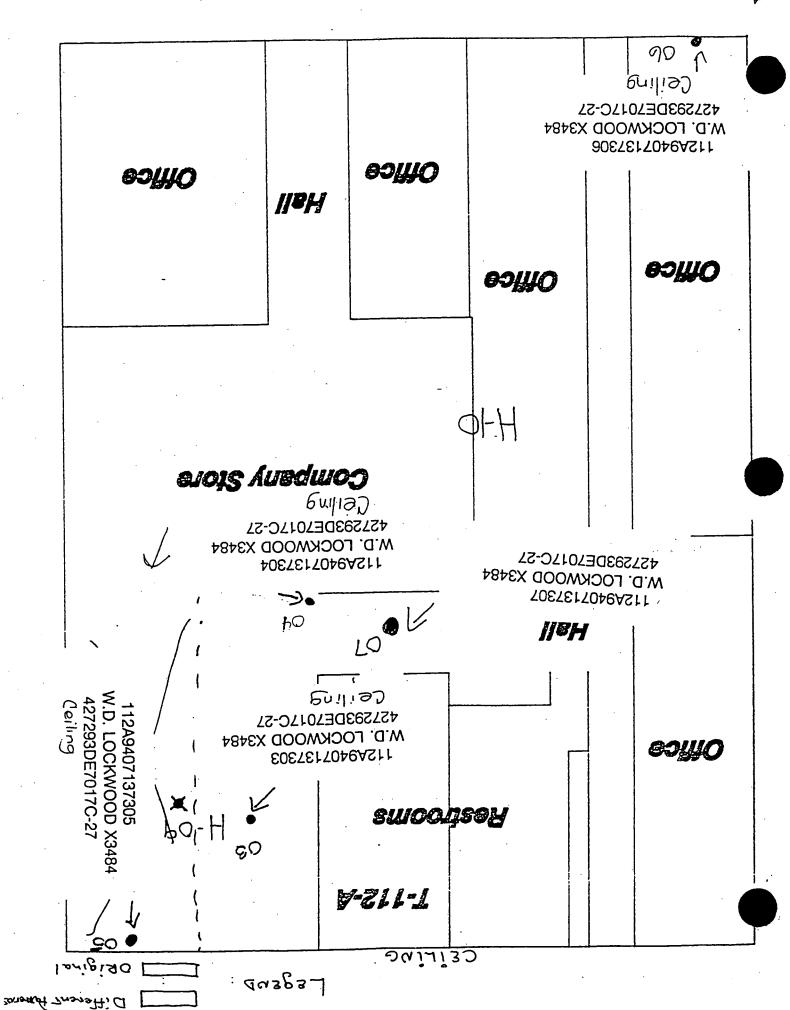
31. Vibration Damper

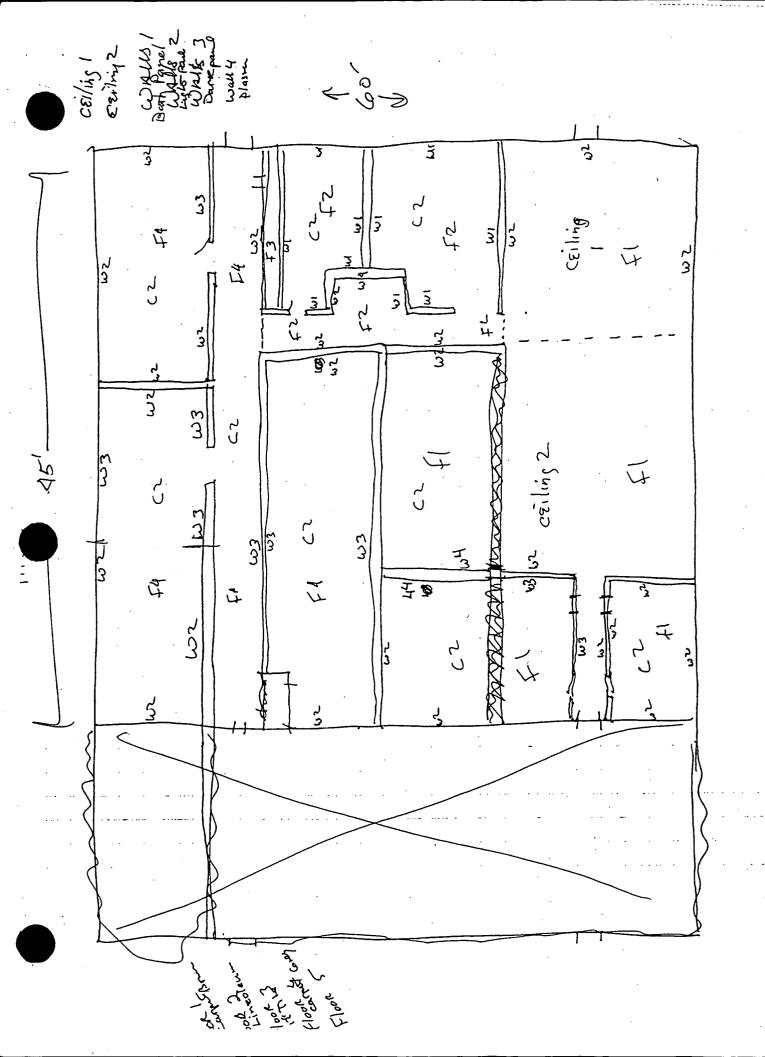
☐ 34. Wall Plaster/Spackie

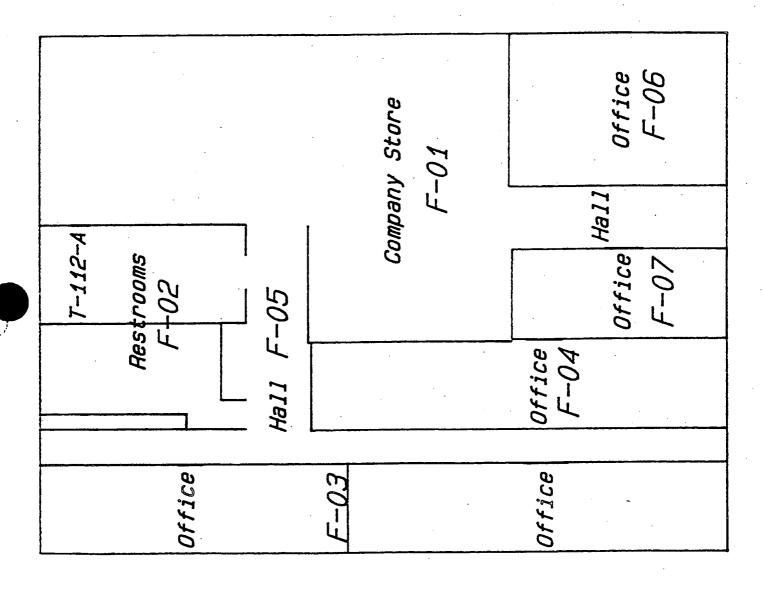
5.

OTENTIAL FOR DAMAGE:	20. RECOMMENDED RESPONSE ACTION:
Low Potential for damage (L)	☐ 1. Response Action #1
Potential for damage (M)	2. Response Action #2
tial for significant damage (H)	D 3. Response Action #3
	☐ 4. Response Action #4
SANCE POTENTIAL	D 5. Response Action #5
REQUENCY OF CONTACT/ACCESSIBILITY:	☐ 6. Response Action #6
0. Low/Seldom (< 1 time/month)	2 7. Response Action #7
	☐ 8. Response Action #8
(e.g., Area Rarely Used)	G 6: 1105pende 7152511 # 5
1 1. Moderate/Occasional (1-4 times/month)	21. DAMAGED INVENTORY PRIORITY
(e.g., Rooms/Offices)	
2 High/Frequently (>4 times/month)	p/n □ 1 □ 2A □ 2B □ 3
(e.g., Hallways/Corridors)	
	22. PLANNED ACTIVITY:
ISTURBANCE POTENTIAL	ال الله
AFLUENCE OF VIBRATION:	MY D System Maintenance
0. Low/None	☐ Required Repair
1. Moderate/Noticeable	D Renovation
(Motors, loud sounds, vibrating ducts w/o fan, etc.)	D Demolition
2. High/Extreme	•
(Easily sensed vibration, vibrating duct w/fan, etc.)	23. OTHER SYSTEMS IMPACTED:
(LASH) Selised Vibration, Violating book Witch, Clary	WED System Shutdown
IOTH IDDALIGE DOTELEIAL	D Backup System in Use
ISTURBANCE POTENTIAL	. a backup dystem in ose
OTENTIAL FOR AIR EROSION:	No Backup/Alternate
0. Low/None	☐ Routine System Maintenance
Moderate or Noticeable Movement	
(Air shaft, Air stream, vent, etc.)	24. POTENTIAL WASTE:
2. High/Extreme velocity	Non friable
(Air Plenum, Elevator Shaft, Fan Room, etc.)	Regulated ACM
	☐ Radiological Contaminated
IST IRBANCE POTENTIAL	RCRA Contaminated
IL POTENTIAL FOR DAMAGE:	
Potential for Damage	25. SAMPLING:
ential for Damage	D > 2 Non ACM - 1000 #2
	N □ ≥ 5, Non ACM, < 5,000 ft.²
dential for Significant Damage	□ ≥ 7, Non ACM, > 5,000 ft. ²
THORAL ADDEDDLIEST CATEGORY	•
HYSICAL ASSESSMENT CATEGORY:	□ ≥ 9, Non ACM
Damaged or Significantly Damaged TSI ACM	D 0, Assumed ACM
2. <u>Damaged</u> Friable Surfacing ACM	i h.
3. Significantly Damaged Friable Surfacing ACM	25.1 N R
4. <u>Damaged</u> or <u>Significantly Damaged</u> Misc. ACM	Sample # % Asbestos Type
5. ACBM with Potential for Damage	
6. ACBM with Potential for Significant Damage	<del> </del>
7. Any remaining Friable ACBM or Friable suspect ACBM	
AZARD POTENTIAL CLASSIFICATION:	
1. ACBM in good condition w/low potential for	
disturbance	
2. ACBM in good condition w/potential for damage	•
3. ACBM in good condition w/potential for signific	28111
damage	25.2 LAB REPORT
4. ACBM in <u>Damaged condition</u> w/low potential for	
disturbance	26. WORK PACKAGE NUMBERS ,
5. ACBM in <u>Damaged condition</u> w/potential for	AI/IA
damage	
6. ACBM in <u>Damaged condition</u> w/potential for	
significant damage	27. COMMENTS: Wood faneling
7. ACBM in a Significantly Damaged condition	Through our the Black
	<u></u>
	·
	·











# HOMOGENEOUS LEGEND

Ceiling

Flo

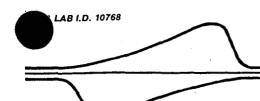
Floor 3

Wall



### **Appendix 8**

**Historical Inspection Report for T112C** 



# RESERVOIRS ENVIRONMENTAL

# Services, Inc.

1827 GRANT STREET

DENVER, COLORADO 80203

(800) 678-7374

(303) 830-1986

FAX (303) 863-9196

July 19, 1994

Ms. Julie Linkus EG&G Rocky Flats Plant PO Box 464 Golden, CO 80402-0464

RE: Job No. RES 20769 - 23586JL/148A - Bulk Samples: 112C9407137301, 112C9407137302, 112C9407137303, 112C9407137304, 112C9407137305, 112C9407137306, 112C9407137307, 112C9407137308 and 112C9407137309.

Dear Ms. Linkus:

Reservoirs Environmental Services, Inc. (RES, Inc.) has analyzed nine bulk material samples by Polarized Light Microscopy (PLM) for asbestos content as per your request. The samples were received on July 14, 1994, and initial results were telephoned to your office on July 18, 1994. PLM was used to analyze the bulk materials in compliance with guidelines established by the USEPA (40 CFR Part 763, Subpart F, Appendix A). The Analytical Results are presented in Table I.

RES, Inc. has assigned job number RES 20769 to this study. This report is considered highly confidential and the sole property of EG&G Rocky Flats Plant. RES, Inc. will not discuss any part of this study with personnel other than those of the client company. Samples will be disposed of after sixty days unless longer storage is requested. The US EPA guideline (40 CFR Part 763, Subpart F, Appendix A) was developed for use on friable building materials and is not recommended for non-friable materials such as floor tiles. RES, Inc. recommends additional analyses to confirm negative PLM results on floor tiles.

If you should have any questions about this report, please feel free to call me at 830-1986.

Sincerely,

Robert K. Dickson

Assistant Division Manager

RKD/cma

Analyst(s):

Cheryl A. Dempsey

Greg Behnfeldt Patrick Coughlan Paul D. Lo Scalzo Robert L. Gault



# RESERVOIRS ENVIRONME... AL SERVICES, INC.

**NVLAP Accredited Laboratory #1896** 

### TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

**RES Job Number:** 

**RES 20769** 

Client:

**EG&G Rocky Flats Plant** 

Client Project:

23586JL/148A

Date Samples Received: Analysis Type:

July 14, 1994 PLM Short Report

Turnaround:

Client Sample	Lab ID Number	TOTAL	L	Physical Description	Portion of Total	ASBESTOS CO BY LAYER	ONTENT	No	n-Asl	pesto		brou %)			Non-Fibrous Components
Number	Number	ASBESTOS	У	Description	Sample (%)	bi Enten		C	G	S	н	w	Т	0	(%)
			e	•	( 70)	Mineral	Visual	L	A	N	A I	L	A L	T H	
		(%)					Estimate (%)	L	s s	T H	R	L	С	E R	
112C9407137301	EM 128544	ND	A	White paint	2		ND	1	1	0	0	0	0	0	98
		j	В	Tan fibrous perlitic material w/tan resinous ma	98   nterial		ND	30	35	0	0	0	0	0	35
112C9407137302	EM 128545	ND	A	White paint	. 1		ND	1	2	0	Ō	0	0	0	97
	•		В	Tan fibrous perlitic material	99		ND	25	40	0	0	0	0	0	35
112C9407137303	EM 128546	ND	А	Tan fibrous perlitic material w/tan resinous ma	100 aterial		ND	30	35	0	0	0	0	,0	35
112C9407137304	EM 128547	ND	A	White-gray resinous paint	2		ND	5	0	0	0	0	Ō	0	95
			B	Tan fibrous material White fibrous plaster	15 83		ND ND	90	0 8	0	0	0	O TR	0	10 90
112C9407137305	EM 128548	ND	A	- ·	2		ND	5	.0 0	0	0	0	0	0	95
•			B C	Tan fibrous material White fibrous plaster	15 83		ND ND	90	0 8	0	0	0	0	0	10 90
112C9407137306	EM 128549	ND	A	White-gray resinous paint	2		ND	5	0	0	0	0	0	0	95
			B	Tan fibrous material	15 83		ND ND	90		0	0	0	0	0	
			C	White fibrous plaster	63		ND.		. 8	U	U	U	U	0	90
ND = None Detected	CELL = Cellulo	se ORG = Org	ganic	WOLL = Wollastonit	6	GYP = Gypsum		Analy	st: LV	V/CD			<del></del>		bes
TR = Trace	Mat = Materia	BRUC = B	rucit	Trem-Act = Tremolite-Actinolite	е	SYNTH = Synth	etic								Data QA



Page

**NVLAP Accredited Laboratory #1896** 

## TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number:

**RES 20769** 

Client:

**EG&G Rocky Flats Plant** 

Client Project:

23586JL/148A

Date Samples Received:

July 14, 1994

Analysis Type:

PLM Short Report

Turnaround:

Client Sample	Lab ID Number	TOTAL	L a	•	Portion of Total	ASBESTOS C	ONTENT	No		besto		rous (%)			Non-Fibrous Components
Number	Number	ASBESTOS	Y		Sample			C	G	S	н	W	T	0	(%)
		(%)	r		(%)	Mineral	Visual Estimate (%)	L	A S	N T H	A I R	L L	A L C	HER	
112C9407137307	EM 128550	ND	A B	Tan & white resin Multicolored fibrous material	10 90		ND ND	2 2	0	0 93	0	0	0	0	98 5
112C9407137308	EM 128551	· ND	A B	White resin w/white plaster. Multicolored fibrous material	15 85	•.	ND ND	5 0	0	TR 90	0	0	0	0	95 10
112C9407137309	EM 128552	ND	A B	Whtie resin w/white plaster Multicolored fibrous material	20 80		ND ND	5 0	3	90 90	0	0	0	0	90
ND = None Detected TR = Trace	CELL = Cellulo Mat = Material	•		WOLL = Wollastonite  Trem-Act = Tremolite-Actinolite		GYP = Gypsum SYNTH = Synth		<del> </del>						-,	Data QA

<b>h</b>	D-P#-S#) D	1	ROCKY FLATS PLANT TRIAL HYGIENE BULK SAM	PLE FORM
2. Process Title:		6. Analytical San	nple Method: PL M	· · · · · · · · · · · · · · · · · · ·
3. Subprocess Title:		7. Lab Report #:	·	
4. Building/OU Etc.:	T-112-C	8. Lab Method:		
5. Chain of Custody Sea	l#:	9. Related Forms	s:	
10. Sample # (Bldg-Y-M-D-P#-S#)	11. Location Information	12. Material Type	13. Bulk Sample Description	14. Results
11209407137301	Ceiling Comm. Rm, SEcom	misc	Random Sampling Pl	
	Ceiling Middle Office necorner		Random Samply ROLL	····
112C94071373 03	Ceiling Harlway nw (near Exit)		Random Soupling	
112094071373 64	Wall- ne commroom		Random Sampling Grid 2	
1120.9467137305	Wall Bottom corner- Doorwall		Random Sampling Grid 2	
11209407137300	Wall Boffom Corner-Doorwa	1	Random Sampling Grid &	·
	Floor - SW Corner		Random Sampling Geid 3	
112094071373 08			Random Sampling Grid 3	
11209407137309	· ·	N/		
			·	
				· · · · · · · · · · · · · · · · · · ·
				·
15. Sampled by/Date: (	Dayne Solwood 7-13-94	16. Checked by/	/Date (Check Back of Form):	



## ats Plant, Inc.

Best Available Copy

Golden, CO 80402-0464
Safety and Hygiene Chain of Custody Record and Analysis Request

Name of Originator: product	Title:			_{r.} Bldg/l	Ext:		Date:	Pag	ge / of /
SAMPLE NUMBER Bldg/Y/M/D/P#/S#	ANALYZE FOR	VOLUME liters	SAMPLE TIME/	MEDIA	P A B	Personal Area Bulk	REMARKS		Lab Number
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1									
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Relinquished by	Received by	Time/		Relinqu	ished	d by	Received by	Time	/Date
Relinquished by	Received by	Time	Date /	Relinqu	ished	d by	Received by	Time	/Date
Relinquished by	Received by	Time	/Date	Relinqu	ished	d by	Received by	Time	/Date
Relinquished by	Received by	Time	/Date	Relinqu	ishe	d by	Received by	Time	/Date
Report and Billing Inst	ruction		Analysis	s Request			Seal# (Release #)	418	4
Varhal Tax				ygiene Samp	ole		Condition of Seal:	——————————————————————————————————————	7
Verbal To:						☐ Broken	☐ Unbr	oken	
Fax To:	Standard Service	Rush	Other		<u></u>	Signature:			
Report To:	Jeivice .	Asbesto	s Samples			Comments:			
Bill To: P.O.#/Release:	<b>a</b>								
Lab: XCANTAN	Standard								
Lau.	·	Service	Rush R	ush					<del></del>

Rocky Flats Plant Asbestos Containing Material

INSPECTION CHECKLIST n Ashestos Found Appendix 1 Inspector W.O. Lakaso Signature Wolfer Accreditation # State BUILDING NO.: T112 9.2 ASSESTOS FORM CODE: BLDG. AREA CODE: Q 6. Pre-immed C 1. Alt cell # 1. 1st Fibor D 2. Blanket J 6. Crawi Space 0 7. Eneo: Q 2 2nd Floor Q 7. Roof D S. Block Q 8. Sprayed On D 9. Troweled On D a. 3rd Floor Q 8. Exterior of Bidg. D 4. Cloth U 4. 4th Floor G 9. D 5. Loose fill D 10. Other: 4 D 5. Basement D 10. Other 9.3 COLOR CODE: ROOM NUMBER: D B Blue D O Orange **COLUMN NUMBERS** D BL Black Q W White □ ERBrown UY Yellow SPECIFIC LOCATION _ G Green O OT Other: D GRGRBY 5. 7. FUNCTIONAL SPACE ____ 10. CONSISTENCY: FUNOTIONAL SPACE LD. ☐ Brittle - hard ☐ Fibrouse - loose HOMOGENEOUS AREA LD. 7. MATERIAL TYPE CATEGORY: 11. CURRENTLY FRIABLE: Q T. Thermal System Insulation O Yes Q No 8. Surfacing Material O M Miscellaneous Material 12. CURRENT MATERIAL DAMAGE: D 1. No Visible Damage (U) 8.1 TSIACM: Q 2. Damaged (D) < 10% Localized or PIPE LENGTH (FT) 8.2 TSIACM: < 25% Distributed PIPE DIAMETER (IN.) B 3. Significant Damage (S) 10% or more Lecalized or 8.3 TSIACM: 25% or more Distributed FIPE WITH INSULATION DIAMETER (IN.) 8.4 - SUFFACING MISC. ACM 12.1 CAUSE OF DAMAGE: D 1. Area Usaça 8.5 TOTAL SURFACE MATERIAL (SQ. FT.) Q 2. Vibration 8.6 SURFACINGMISC ACM: Q 3. Air Flow DEPTH OF SURFACE MATERIAL (IN.) Q 4. Water Damace C 5. Service Activity Q 6. Usual Aging ☐ 7. Other: 9.1 FUNCTION CODE: a 1. Acoustic insulation 19. Exterior Construction 13. CONTAMINANT PRESENT: a 20. Floor Tile 2 Baseboard ☐ 3. Boller/Furnace Insulation ☐ 21. Fire Stop O C. None □ 22. Fireproofing insulation ☐ 1. Spotty Q 4. Czulking Matt Q 23, High Temp Water Pipe Q 5. Celling Tile D 2. Widely Scattered Q 3. Entire Area Chilled Water Pipe 24. High Temp Water D 7. "Chilled Water Pips Fitting Pipe Fitting 14. DISPERSAL FACTOR: 2 8. Cold Water Pipe Q 25. Mastic Adhesive 1. Water ☐ 3. Occupant 9. Cold Water Pipe Fitting D 26. Roofing Q 10. Condensate Pipe Q 27, Steam Pipe 0 2 Air Q 4. Machinary 11. Condensate Pipe Fitting Q 28. Steam Pipe Fitting 15. AREA USED BY: ☐ 12. Cooling Tower Baffles D 29. Tank Insulation Maintenance Workers 13. Debris/Settled Dust D 30. Transite Board Q Operations Workers 14. Domestic Cold 2 31. Vibration Damper Water Pipe D 32. Wall Board Q Administrative Personnel

> D 33. Wall Insulation Q 34, Wall Plaster/Spackle

☐ 35. Other: .

Q Visiting Public



☐ 15. Domestic Cold

□ 18. Door Q 17. Drain Pipe 18, Duct Insulation

Water Fitting

16. POTENTIAL FOR DAMAGE:	20. RECOMMENDED RESPONSE ACTION:
D Low Potential for damage (L)	O 1. Response Action #1
☐ Potential for damage (M)	Q 2. Response Action #2
☐ Potential for significant damage (H)	Q 8. Response Action #3
	Q 4. Response Action #4
17.1 DISTURBANCE POTENTIAL	D 5. Response Action #6
FREQUENCY OF CONTACT/ACCESSIBILITY:	D 8. Response Action #6
O 0. Low/Seldom (< 1 time/month)	☐ 7. Response Action #7 ☐ 8. Response Action #8
(e.g., Arek Rarely Used) Q 1. Moderate/Occasional (1-4 times/month)	C a. Haspottse Action to
(e.g., Rooms/Offices)	21. DAMAGED INVENTORY PRIORITY
Q 2. High/Frequently (>4 times/month)	Q 1 Q 2A Q 2B Q 3
(e.g., Hallways/Comdors)	
(3.64)	22. PLANNED ACTIVITY:
17.2 DISTURBANCE POTENTIAL	C New Activity/Use
INFLUENCE OF VIBRATION:	System Maintenance
D & Low/None	☐ Required Repair
1. Moderate/Noticeable	□ Renovation
(Motors, loud sounds, vibrating ducts w/o fan, etc.)	Q Demolition
D 2. High/Extreme	
(Easily sensed vibration, vibrating duct w/fan, etc.)	23. OTHER SYSTEMS IMPACTED:
17.3 DISTURBANCE POTENTIAL	System Shutdown     Backup System in Use
POTENTIAL FOR AIR EROSION:	O No Backup/Alternate
D 0, Low/None	O Routine System Maintenance
Q 1. Moderate or Noticeable Movement	e realise of new mentalise
(Air shaft, Air stream, vent, etc.)	24. POTENTIAL WASTE:
D 2. High/Extreme velocity	☐ Non friable
(Air Pienum, Elevator Shaft, Fan Room, etc.)	D. Regulated ACM
	Radiological Contaminated
17.4 DISTURBANCE POTENTIAL	RCRA Contaminated
OVERALL POTENTIAL FOR DAMAGE:	
O O, Low Potential for Damage	25. SAMPLING:
O 1. Potential for Damage	☐ ≥ 8, Non AOM, < 1000 ft.2
Q 2. Potential for Significant Damage	□ ≥ 5, Non ACM, < 5,000 ft. ²
18. PHYSICAL ASSESSMENT CATEGORY:	D ≥ 7, Non ACM, > 5,000 fL² D ≥ 9, Non ACM
D 1. Demaged or Significantly Demaged TSI ACM	D O, Assumed ACM
2 Damaged Friable Surfacing ACM	a of watering volut
Q 3. Significantly Damaged Friable Surfacing ACM	25.1
Q 4. Damaged or Significantly Damaged Misc. ACM	Sample # % Asbestos Type
D 5. ACBM with Potential for Damage	Todasas type
D 6. ACBM with Potential for Significant Damage	
☐ 7. Any remaining Friable ACBM or Friable suspect ACBM	
10 UITAND DOTTUMAL OF FORMATION	
19. HAZARD POTENTIAL CLASSIFICATION:  0 1. ACBM in good condition w/low potential for	
disturbance	
© 2 ACBM in good condition w/potential for damage	
Q 3. ACBM in good condition w/potential for significan	int L
demage	
4. ACBM in <u>Damaged condition</u> w/low potential for	25.2 LAB REPORT
disturbance	on Montenation Williams
7 5 ACBM in Damaged condition w/potential for	28. WORK PACKAGE NUMBERS
damage	
4 6. ACBM in <u>Damaged condition</u> w/potential for	27. COMMENTS:
significant damage  1 7. ACBM in a Significantly Damaged condition	
— FEFTONIE III & ENGINEERING DESIRATED CANCILLOS	

1.	Inspector W.O. Lackass Signature ColorDen	Accreditation # State CO
2.	BUILDING NO.: TIZC  BLDG. AREA CODE:  X 1. 1st Floor	9.2 ASBESTOS FORIX CODE:  1 1. Air coil
3.	ROOM NUMBERS NA	9.3 COLOR CODE:  D B Blue D O Orange D SL Black D W White D ER Brown D Y Yellow
	SPECIFIC LOCATION SE Corner	D G Green D OT Other:
٥.	% functional space 100%	10. CONSISTENCY:
6.	HOMOGENEOUS AREA LD	D Brittle - hard D Fibrouse - loose W/A
7.	MATERIAL TYPE CATEGORY:  D. T. Thermal System Insulation  D. S. Surfacing Material	11. CURRENTLY FRIASLE/ D Y20 & No
	M Miscellaneous Material	12. CURRENT MATERIAL DAMAGE:  2 1. No Visible Damage (U)
	TSI ACM: PIPE LENGTH (FT) NA	© 2. Damaged (D) < 10% Lecslized or
8.2	TSI ACM: PIPE DIAMETER (!N.) W	< 25% Distributed  O 3. Significant Damage (S)
	TSI ACM:	10% or more Localized or
	PIPE WITH INSULATION DIAMETER (IN.)	25% or more Distributed
	SURFACING MISC. ACM:	12.1 CAUSE OF DAMAGE:
8.5	TOTAL SURFACE MATERIAL (SQ. FT.)	1. Area Usage
-0.0	SURFACINGMISC ACM:	Cl 2. Vibration Cl 3. Air Flow
<b>\$.</b> \$	DEPTH OF SURFACE MATERIAL (IN.)	D 4. Water Damage
	/4"	D 5. Service Activity
		D 6. Usual Aging
9.1	FLINCTION CODE:	. D 7. Other:
	Q 1. Acoustic insulation Q 19. Exterior Construction Q 2. Baseboard Q 20. Floor Tile	13. CONTAMINANT PRESENT:
	D 3. Boller/Furnace Insulation D 21. Fire Step	© 0. None
	Caulking Matt     D 22. Fireproofing Insulation	D 1. Spotty
	□ 5. Ceiling Tile □ 23. High Temp Water Pipe	D 2. Widely Scattered
	D 6. Chilled Water Pipe D 24. High Temp Water	Q 3. Entire Area
	D 7. Chilled Water Pipe Fitting Pipe Fitting	
	D 8. Cold Water Pipe D 25. Mastic Adhesive	14. DISPERSAL FACTOR:
	9. Cold Water Pipe Fitting Q 26. Roofing	☐ 1. Water ☐ 3. Occupant
	10. Condensate Pipe	☐ 2. Air ☐ 4. Machinery
	11. Condensate Pipe Fitting 22. Steam Pipe Fitting	15. AREA USED BY:
	Q 12. Cooling Tower Baffles Q 29. Tank Insulation Q 13. Debds/Settled Dust Q 30. Transits Board	D Maintenance Workers
	D 14. Demestic Cold D 31. Vibration Damper	C Coerations Workers
	Water Pipe D 32. Wall Board	☐ Administrative Personnel
	D 15. Domestic Cold D 33. Wall insulation	Q Yielding Public
	Water Fitting Q 34. Wall Plaster/Spackle	-
	1 18. Door 1 35. Other: Doo Calling	
	□ 17. Drain Pipe	•
	O 18. Duct Insulation	

	•					
16	POTENTIAL FOR DAMAGE:	20.	RECOMMEND	ED RESPONSE ACT	10N:	
10.	D Low Potential for damage (L)		O 1. Respon			
	D Potential for damage (M)		2. Respon			
			C 3. Respon			
	Potential for significant damage (H)		Q 4. Respon			
	. mon the steam name with		5. Respon		•	
17.	DISTURBANCE POTENTIAL					
	FREQUENCY OF CONTACT/ACCESSIBILITY:		☐ 8. Respon	· ·		
	O. Low/Seldom (< 1 time/month)		7. Respon			
	(e.g., Area Rarely Used)		B. Respon	ISO ACTION ES		
	☐ 1. Moderate/Occasional (1-4 times/month)		- 4444 655 45			
	(e.g., Rooms/Offices)	21.		VENTORY PRIORITY		
	Q 2. High/Frequently (>4 times/manth)		01 02	A 0,28 0;	3	
	(e.g., Hallways/Corridors)					
		22.	PLANNED AC			
17.	2 DISTURBANCE POTENTIAL		☐ New Activ			
	INFLUENCE OF VIBRATION:		© System M	aintenance		
	0. Low/None		D Required R	Repair		
	☐ 1. Moderate/Noticeable		Q Renovatio	ก		
	(Motors, loud sounds, vibrating ducts w/o fan, etc.)		Demolition	ח		
	D 2 High/Extreme					
	(Easily sensed vibration, vibrating duct w/tan, etc.)	23.	OTHER SYSTI	EMS IMPACTED:		
			□ System S	hutdown	•	
17.3	DISTURBANCE POTENTIAL		D Backup Sy			
	POTENTIAL FOR AIR EROSION:		O No Backu			
	Q 0, Low/None			ystem Maintenance	1	
	D 1. Moderate or Noticeable Movement			,		
	(Air shaft, Air stream, vent, etc.)	24.	POTENTIAL V	VASTE:		
	D 2. High/Extreme velocity	,	D Non frieble	— .		
	(Air Pienum, Elevator Shaft, Fan Room, etc.)		D Regulated		•.	
	(var ) received Emergen estand 1 dir treeting estand		_	al Contaminated		
17.4	DISTURBANCE POTENTIAL		D RCRA Con			
	OVERALL POTENTIAL FOR DAMAGE:		a nona ogn	INTINIERA		
	Q O. Low Potential for Damage	25	SAMPLING:	:		
	Q 1. Potential for Damage	۵3.		ON - 4000 B2		
	2. Potential for Significant Damage			CM, < 1000 ft.2		•
	CI & Potential for Significant Datinge			CM, < 5,000 ft ²		
10	PHYSICAL ASSESSMENT CATEGORY:			CM, > 5,000 fL ²		
10,	1. Damaged or Significantly Demaged TSI ACM		D≥9, Non At			
	☐ 2. Damaged Friable Surfacing ACM		C 0, Assumed	ACM		•
	Q 3. Significantly Damaged Friable Surfacing ACM	nc 4				•
		25.1				
	O 4. Damaged or Significantly Damaged Misc. ACM O 5. ACBM with Potential for Damage		Sample #	%	Asbestos	Type
•			_	· · · · · · · · · · · · · · · · · · ·		
	O 8. ACBM with Potential for Significant Damage		· · · · · · · · · · · · · · · · · · ·			
	O 7. Any remaining Friable ACBM or Friable suspect ACBM	-			<del> </del>	
40	LIATARD ROOTSTILL OF A CORNAL TIME!	<b>-</b>	<del></del>		<del> </del>	
18.	HAZARD POTENTIAL CLASSIFICATION:	-				
	Q 1. ACBM in good condition w/low potential for	<u> </u>			<u> </u>	
	disturbance					
	© 2 ACBM in good condition w/potential for damage					
	D 3. ACBM in good condition w/potential for significant	ıt L			L	
	damage	25.2	I AR REPORT	· <u></u>		
	□ 4. ACBM in <u>Damaged_condition</u> w/low potential for	23,6	-AB MELOKI			
	disturbance	20	WOOY DACKE	oc Minacao	•	
	D 5. ACBM in <u>Damaged condition</u> w/potential for	<i>∞</i> .	WORK PACKA	ae numbers		•
	damage					
	6. ACBM in <u>Damaged condition</u> w/potential for	97	COUNTRY			
	*ignificant damage	٤١.	COMMENTS:			
	J. 7. ACBM In a Significantly Damaged condition		<del></del>	···	<del></del> .	
						•

Appendix 1

1.	Inspector W.O. Lackasod Signature Wooden	)	Accreditation # State	. (0
••,	Data		Out	
2.	BUILDING NO.:	9.2	ASSESTES FORM CODE:	
	BLDQ. AREA CODE:		D. 1. Alt cell C. S. Pr -formsd	
	1 1. 1st Floor D 6. Craw Space		D 2 Blanket U.7. Snoet	
	Q 2 2nd Floor D 7. Roof		D. S. Block D. S. Sprayed On	
	Cl 3. 3rd Floor Cl 8. Exterior of Bidg. Cl 4. 4th Floor Cl 9. Plenum		LI 4. Cloth LI 9. Iroweled Ch	
	Q 4. 4th Floor Q 8. Plenum		D 5. Loose fill D 10. Other:	<del></del> -
	D 5. Basement D 10. Other			
_		9.3	COLOR CODE:	
3.	ROOM NUMBER:		D B Blue D O Orange D BL Black D W White	
	COLUMN NUMBERS		<del></del>	
4.	SPECIFIC LOCATION		D G Groen D OT Other:	
_	~ BINOTIONAL PRACE		u Grasy	
5.	% FUNCTIONAL SPACE	40	CONSISTENCY:	
^	CINOTIONAL SPACE LD	10.	☐ Brittle - hard ☐ Fibrouse - loose	
6.	FUNOTIONAL SPACE LD. HOMOGENEOUS AREA LD.		D Semi - solid O Granular - pliable	·
	MOMOGENEOUS ANEX ID.		C Sant - 1010 C Stational - Pages	
7	MATERIAL TYPE CATEGORY:	11	CURRENTLY FRIABLE:	
	☐ T. Thermal System insulation	• • • •	□ Yes □ No	
	D & Surfacing Material		2	
	D M Miscellaneous Material	12	CURRENT MATERIAL DAMAGE:	•
	C IK MIOSSING IOOGG MARKING	, 44	☐ 1. No Visible Damage (U)	
0 4	TSI ACM:		Q 2. Damaged (D)	
9.1	PIPE LENGTH (FT)		< 10% Localized or	
	TSI ACM:		< 25% Distributed	
	PIPE DIAMETER (IN.)		Q 3. Significant Damage (S)	
	TSI ACM:		10% or more Localized or	
نده	PIPE WITH INSULATION DIAMETER (IN.)		25% or more Distributed	
	PIPE WITH INDUCTION DIMNICTER (IN.)		To 19 of this Biographic	
φ.i.	SURFACING MISC. ACM:	12.	1 CAUSE OF DAMAGE:	•
	TOTAL SURFACE MATERIAL (SQ. FT.)		D 1. Area Usage	
0.0	TOTAL COST MALE INTERPRETATION OF		Q 2. Vibration	
. 6 6	SURFACINGMISC ACM:		D 3. Air Flow	
· 5.0	DEPTH OF SURFACE MATERIAL (IN.)		☐ 4. Water Damage	
	DEL LILON GOLD VOE WAS EXPECTIVED		☐ 5. Service Activity	
			D 6. Usual Aging	
0.1	FUNCTION CODE:	•	□ 7. Other:	
8.1	Q 1. Acoustic Insulation Q 19. Exterior Construction			
	Q 2. Baseboard Q 20. Floor Tile	13.	CONTAMINANT PRESENT:	
	D 3. Boller/Furnace insulation D 21. Fire Stop	•	O. None	
	12 4. Czulking Mari D 22. Fireproofing insulation		□ 1. Spotty	
	D 5. Ceiling Tile D 23. High Temp Water Pipe		☐ 2. Widely Scattered	
	Chilled Water Pipe     24. High Temp Water		☐ 3. Entire Area	
	12 7. Chilled Water Pipe Fitting Pipe Fitting			
		14.	DISPERSAL FACTOR:	
	D 9. Cold Water Pipe Fitting D 26. Roofing		1. Water 0 3. Occupant	
	Q 10. Condensate Pipe Q 27. Steam Pipe		D 2. Air D 4. Machinery	
	Q 11. Condensate Pipe Fitting Q 28. Steam Pipe Fitting		•	
	Q 12. Cooling Tower Baffles Q 29. Tank Insulation	15.	AREA USED BY:	
	13. Debris/Settled Dust 130. Transite Board	-	☐ Maintenance Workers	
	Q 14. Domestic Cold Q 31. Vibration Damper		Operations Workers	
	Water Pipe D 32. Wall Board		☐ Administrative Personnel	
	15. Domestic Gold D 33. Wall Insulation		Q Visiting Public	
	Water Fitting Q 34. Wall Plaster/Spackle		•	•
	☐ 18. Door ☐ 35. Other:			
	17. Drain Pipe		•	
	18. Duct Insulation			

	•					
16.	POTENTIAL FOR DAMAGE:	20.	RECOMMEN	DED RESPONSE ACT	TON:	
	D Low Potential for damage (L)	-	Q 1. Respor	ise Action #1		
	Potential for damage (M)		Q 2. Respor	nse Action #2		
	Potential for significant damage (H)		Q 3. Respon	ree Action #3		
	C . Alexandra des estacutamente municales los la			rse Action #4		•
179	DISTURBANCE POTENTIAL		•	rae Action #5		
17.	FREQUENCY OF CONTACT/ACCESSIBILITY:			nse Action #6		
	D 0. Low/Saldom (< 1 time/month)			rse Action #7		
	(e.g., Area Rarely Used)			nse Action #8		
	1. Moderate/Occasional (1-4 times/month)		<b>—</b> 0, ,,,,,,			
	(e.g., Rooms/Offices)	21	DAMAGED IN	IVENTORY PRIORITY	,	
	2. High/Frequently (>4 times/month)	41.	01 02			
	(e.g., Hallways/Corridors)		÷		_	
	(aight timing) a delinears)	99	PLANNED AC	CTIVITY:		
175	DISTURBANCE POTENTIAL		O New Acti			
1 7 .4	INFLUENCE OF VIBRATION:		O System M			
	D. C. Low/None		Q Required i		-	
	1. Moderate/Noticeable		Q Renovation			
	(Motors, loud sounds, vibrating ducts w/o fan, etc.)		Q Demolitic			
•	© 2. High/Extreme		O Demonito			
		62	OTLED CYCT	EMS IMPACTED:		
	(Easily sensed vibration, vibrating duct w/fan, etc.)	٤٥.	•			
477	DICTI IDDANCE DOTTATIAN		System S		•	
17.3	DISTURBANCE POTENTIAL		Backup Sy			
	POTENTIAL FOR AIR EROSION:		O No Backu			•
	O. Low/None     1. Moderate or Noticeable Movement		u Routine S	ystem Maintenance	٠.	
			OCCENTRAL I	HAPPA		
	(Air shaft, Air stream, vent, etc.)	24.	POTENTIAL V			
	D 2. High/Extreme velocity		O Non friable		•	
	(Air Pienum, Elevator Shaft, Fan Room, etc.)		C) Regulated			
	DICTIONALIAE PATENCIAE			al Contaminated		
17.4	DISTURBANCE POTENTIAL		, D. RCRA Cor	ttaminated		
	OVERALL POTENTIAL FOR DAMAGE:					
	Q 0. Low Potential for Damage	25.	SAMPLING:			
	O 1. Potential for Damage			ACM, < 1000 ft.2		-
	Q 2. Potential for Significant Damage			VCM, < 5,000 ft.2		
	PIRANAL ADDEDDIEST AATEODIS			CM, > 5,000 ft2		
18.	PHYSICAL ASSESSMENT CATEGORY:		D≥9, Non A			
	☐ 1. Damaged or Significantly Damaged TSI ACM☐ 2. Damaged Friable Surfacing ACM☐		O, Assume	d acm		
	3. Significantly Damaged Friable Surfacing ACM     Compared at Significantly Damaged Mine ACM	25.1		<del></del>		
	D 4. Damaged or Significantly Damaged Misc. ACM	· L_	Sample #	%%	Asbestos	Туре
	D 5. ACBM with Potential for Damage					
	D B. ACBM with Potential for Significant Damage		والواليات الكوائد والمراجع		·	
	12 7. Any remaining Friable ACBM or Friable suspect ACBM	-			<del> </del>	
40	1147ADD DOTCHTIAL OF ACCIDING TION.	<u> </u>	<del></del>	<del></del>	<del> </del>	
19.	HAZARD POTENTIAL CLASSIFICATION:	<b> </b>				
	Q 1. ACBM in good condition w/low potential for				<u> L</u>	
	disturbance					
	Q 2 ACBM in good condition w/potential for damage					
	D 3. ACBM in good condition w/potential for signific	ant				
	damage	25.2	LAR REPORT	·	•	
•	4. ACBM in <u>Damaged condition</u> w/low potential for					
	disturbance	26	WORK PACKA	GE NI IMBERG		•
	O S. ACBM in <u>Damaged condition</u> w/potential for		******************	11-1711		
	damage					
	G 6. ACBM in Damaged condition w/potential for	27	COMMENTS			•
	significant damage					
	J 7. ACBM in a Significantly Damaged condition		·	<del></del>		
				<del></del>	<del></del>	

NEW Trailer All Areas T-112-C Telecom 20 Offices 112C9407137301 W.D. LOCKWOOD X3484 427293DE7017C-27 112C9407137309 Ceiling W.D. LOCKWOOD X3484 427293DE7017C-27 FIOOR 112C9407137304 W.D. LOCKWOOD X3484 427293DE7017C-27 WAIL 02 112C9407137302 112C9407137305 Mices W.D. LOCKWOOD X3484 W.D. LOCKWOOD X3484 427293DE7017C-27 427293DE7017C-27 05 WALL Ceiling Hall 112C9407137308 W.D. LOCKWOOD X3484 427293DE7017C-27 Floor Offices 112C9407137303 112C9407137306 W.D. LOCKWOOD X3484 W.D. LOCKWOOD X3484 427293DE7017C-27 427293DE7017C-27 Ceiling Wall Offices 112C9407137307 W.D. LOCKWOOD X3484 427293DE7017C-27 FLOOR 1000 sq. ft.

254

## ROCKY FLATS ENVIRONMENTA TECHNOLOGY SITE T-112C

# HOMOGENEOUS LEGEND

Ceiling





Appendix 9

**RLC Inspection Report for T112A** 

## **ASBESTOS INSPECTION REPORT**

## BUILDING T112A PU&D YARD

September 27, 1999

Prepared for:

Paul Wojtaszek

Rocky Mountain Remediation Services

Prepared by:

Commodore Advanced Sciences, Inc.

143 Union Blvd., Ste. 660 Lakewood, CO 80228 RFETS: T891V; x-6508

# ADVANCED SCIENCES, INC.

### Jen Wingard

Sampling Technician jen.wingard@rfets.gov

RFETS, Bidg #T891V P.O. Box 464 Golden, CO 80402-0464 Phone: (303) 966-6508 Fax: (303) 966-3308 Pager: (303) 212-3184

143 Union Blvd., Ste. 660 Lakewood, CO 80228 Phone: (303) 980-0036 Fax (303) 980-1206

#### 1.0 SUMMARY

An asbestos inspection of trailer T112A was conducted by Commodore Advanced Sciences at Rocky Flats Environmental Technology Site (RFETS) on September 27, 1999. Inspection and sampling was conducted for Paul Wojtaszek to determine the trailer's asbestos quantities for demolition and future disposal in a landfill.

#### 2.0 SCOPE

Commodore Advanced Sciences was responsible for visual inspection of specified areas to identify asbestos-containing material (ACM); bulk sampling of suspect materials and transport of samples to an accredited lab for analysis by Polarized Light Microscopy (PLM).

#### 3.0 PROCEDURE

Inspection and sampling were performed by Jen Wingard, a licensed Asbestos Inspector certified by the State of Colorado and the Environmental Protection Agency. All work was completed per 40 CFR 763.86, 5 CCR 1000-10, RFETS Asbestos Characterization Procedure (PRO-563-ACPR), and CAS Sampling for Waste Characterization (CAS SOP-003). Michelle Hershey acted as witness and spotter as needed.

Bulk samples were delivered to CAS trailer T891R for shipment to the accredited lab Reservoirs Environmental Inc.

#### 4.0 RESULTS

Building T112A is a five-wide trailer previously used for administrative offices and currently abandoned and located in the PU&D yard awaiting disposal. It is a wood and metal structure that contains multiple office-type rooms and two restrooms. The inside walls consisted of wood paneling with two "newer" drywall walls that had no surface coverings or taped joints. No samples were collected.

The floors consisted of carpet and tile. A different contractor previously sampled ceiling tile and floor tile on 4/21/99. Both contained no asbestos components. The tile mastic was found to contain 70% Chrysotile. On 9/27/99 CAS made the assumption that the cove base cement used in both bathrooms is also non-friable asbestos-containing material. No samples were collected.

Air ducts and waterlines were not individually insulated and had only the existing loose fiberglass insulation around them. Electrical lines and panels were also free of any potential ACM. No samples were collected.

One roof sample was collected which consisted of four layers. There was a gray putty-like material, which appeared to be used to hold the five sections of the trailer together. The actual roofing material consisted of two layers of brown resinous material on top of a very thin layer of silver paint or paper. Reservoirs Environmental Inc. which analyzed the samples found the putty to contain 15% Chrysotile, the silver paint 4% Chrysotile and the remainder free of asbestos. All materials were non-friable.

#### Inspection Summary Table:

Potential ACBM	Locations	Conclusion
Surfacing Material	None detected	N/A
Thermal System Insulation	None detected	N/A
Miscellaneous	Tile mastic; non-friable	70% Chrysotile; 4/21/99
	Cove base cement; non-friable	Assumed; 9/27/99
	Roofing, non-friable:	1
	Putty/plaster	15% Chrysotile; 9/27/99
	Resinous material	N/A
	Silver paint	4% Chrysotile; 9/27/99

#### 5.0 ATTACHMENTS

Chain-of-custody for sample 99Z0382-001.001 (T112A9909270101)
Analytical data from Reservoirs Environmental Services, Inc.
Asbestos Sampling Data Sheet
Asbestos Containing Material Inventory Worksheet
Field worksheet

## RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NYLAP Accredited Laboratory #1896

Page 1 of 1

TUE 07:13

## TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: Client: Client Project: Data Samples Received: Analysis Type: Turnaround:		99Z03B2, September	Analytical Services Division J. Wingard r 27, 1999 : Report, Bulk	Note: The US EPA requires use of stratified analysis for NESHAP and AHERA compliance. Composite results only apply for specific exceptions.										
Client Sample Number	Lab ID Number	t e y	Physical Description	Portion of Total Sample (%)	ASBESTOS CO BY LAY Mineral		No.	_		os Fi Bnbs H A I R		_	0 T H E R	Non-Fibrous Components (%)
9920382-001	EM 435244	B Bro	er peint wn resinous mateial y plaster	3 17 80	Chrysotile Chrysotile	4 ND 15	0	0	0 0	0 0 0	0 0	0	000	96 100 85

Kai			CI	IAI	N OF CUSTOD	· ·	Arc I.I	E ANAL	YSIS RE	QUEST	•		CO.C.# 99 Page	2Z038	
	FETS			10	Contact/Requester			· · · · · · · · · · · · · · · · · · ·	Te	lephone No.		.MSIN	FAX	<u> </u>	7
Collector				1	CICHORZ, ROGER				Pri	<u>303-966-2155</u> rehase Order	Charge	Code			
99Z038	2				Sampling Origin	· ·		·		15010420 Chest No.			Temp.		
roject Title			_	Ī	Logbook No.								.ешр.	A	
o (Lab) Rese	rvoirs Environme	ntal		ř	Method of Shipment			·		i of Lading/A	Jr Bui N	0.			
rotocol									PF	E					
OSSIBLE SAN	PLE HAZARDS/REI	MARKS				Si	PECIAL IN	STRUCTION	3 Hold Ti	mt .	1	otal Activit	y Exemption:	Yes 🔟	No L
Bonie Na.	Customer	Matrix	Date	Time	Location	 No/Ty ₇	pe Container	<del></del>		Sample Anal	ysia		<del></del> -	Preserv	raŭve ; king
99Z0382- 001.001	Number T1129092701011	IH			T112A	1-NA	N/A	IH02B004	(Asbestos -	bulk (PLM	) off-sii	te) [Rush		N/A None	
												<del></del>			
													·	-	
:								-							
·						<del></del> · · · ·	· · · · · · · · · · · · · · · · · · ·		•						
										· · · · · · · · · · · · · · · · · · ·				<u> </u>	
Relinquished By:		Dete/Time	Received By		Dale	Ліпе	Rolinquishe	_		Date/Time	Received				ele/Time
Relinquished By:		Dale/Time	Received By			Time	Relinquishe				Received				Me/Time
Relinquished By:		Date/Time	Received By		·	Time	Relînquishe			Date/Time	Received				we/Time
Relinquished By:		Dale/Time	Received By		·	Time	Relinquishe			Date/Time	Received	By:		D:	ne/Time
FINAL SAME DISPOSITIO		(e.g., Return to cos	ocmer, per lab	la congrate	n, used in process)			Disposed B ₂					Date/Time		

## Asbestos Containing Material Inventory Worksheet

Building Number 112H Room Number NA Date 7 Pipe insulation:	<u>ICH</u> 4
Type: NO ACM; FIBERGLASS ONLY Linear	r/sq. ft Fitting count:
Type:Linear	r/sq. ft Fitting count:
Type:Linear	r/sq. ft Fitting count:
Type:Linear	r/sq. ft Fitting count:
Duct insulation:	
Type: NO ACM; FIBERGLASS ONLY Duct Size Papp.	Sq. ft
Type:Duct Size/app	Sq. ft
Type:Duct Size/app	Sq. ft
Type:Duct Size/app	Sq. ft
Other:	
·	
SURFACE INVENTORY:	
Location: No ACM Description:	Sq. ft
Location:Description:	Sq. ft
Location:Description:	Sq. ft
Location:Description:	Sq. ft
MISCELLANEOUS INVENTORY:	
Location: Bathrooms Description: Coverase Cemen-	Sq. ft
Location: Hoor Tile Description: Tile Mastic	Sq. ft
Location: Roof Description: Gray putty-like	coment sq. ft.
Location: Roof Description: Silver painte page	Sq. ft
PREPARED BY JEW WINGALD DA	ATE 9/27/99
SIGNATURE ju Wingard	

# FIELD ASI SAMPLE REQUEST WORKSHEET

007	A 10
RIN: 9920382	WASTE STREAM ID:
EVENT: 001	CUSTOMER SAMPLE ID:
DUPLICATE ID: NA	FIELD BLANK ID:
ISSUE DATE: 092799	EQUIPMENT BLANK ID:
18862 5.112(2)//	TRIP BLANK:
•	TRII DEA!AR.
	•
Comments/Problems encountered du	ring sampling: We sampled on the
roof between section	ns at point +12 labeled in tage.
tw sampled; MH with	assed.
NO SAY required per aust	omer; no airpung regulard per 1tt.
_	•
Location Description:   KAI   ZK	112A LOCATED IN PUOD YARD.
ROOF SITE "F12"	
	,
OIL ID TI1299 997701	<b>0</b> 1
Other ID: 711299 092701	0
Somale Assessed to the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of th	10 151/0 nonla > 1 511
Sample Appearance: arty	lay-like majorial with
silver paper on brown	or material on black maderial.
Sampling Device: Chisel, Meta	Q.
Sample Date: 9/22/99 Samp	ole Time: 1339 Rad Screen Sample Date: 18
1/2/1/	,
Was generator notified to receive excess	sample? (Yes) (No)
	SAMPLE WITHESSO ONLY
111111111111111111111111111111111111111	
Sampler's Signature: WMQ	nd Thechelle Nershey
Employee Number	
Employee Number:	
Date: 9/27/99	9127199

Asbestos Sampling Data Sheet

Job# 992638Z Name JEN WINGARD Date 9/27	7/99
-----------------------------------------	------

General Description of building/area: BLDG TI12A IN PUYD WARD (TRAILER)

Sample Number	Sample Description and Location
T112A9909270101	ROOFING MATERIALS: GRAY PUTTY FROM BETWEEN
	TRAILER SECTIONS; ROOF RESINOUS COMPOSITE
	2 BROWN LAYERS WITH SILVER PAINT COR
	PAPER FIRMLY ATTACHED.
	149
	12129 12129
<u> </u>	
10	100 /0 - 100 /0 - 100 /0 -
PREPARED BY	N WINGARD DATE 9/27/29
SIGNATURE	in wingard